VOL. LXXXII PART NINE

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

SEPTEMBER 1957

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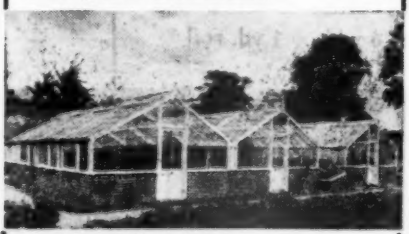

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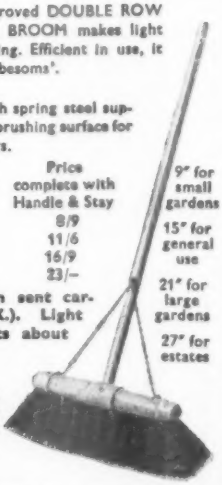

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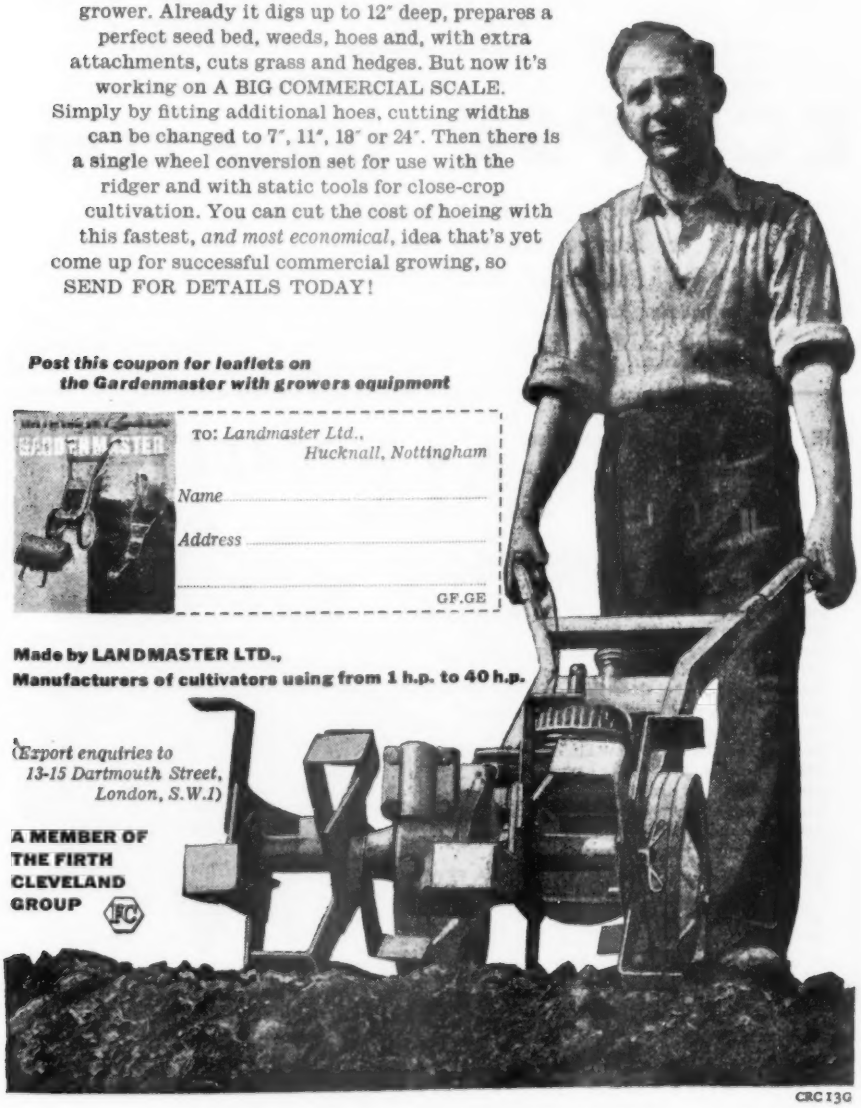

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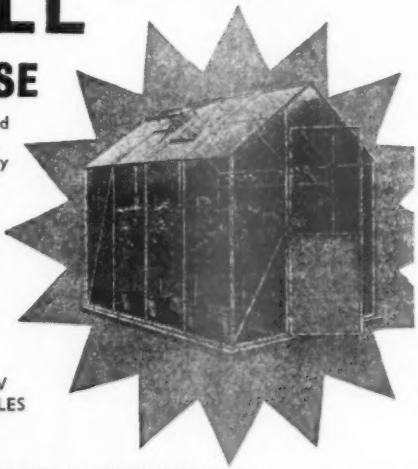

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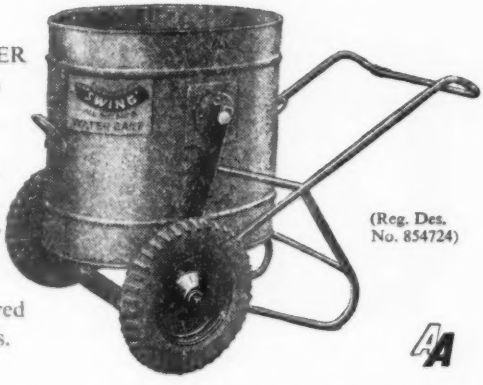

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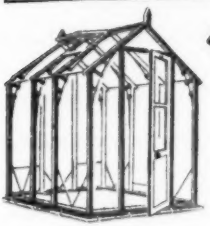

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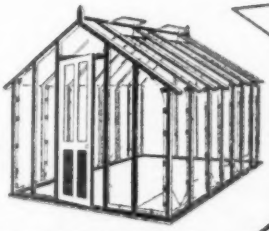

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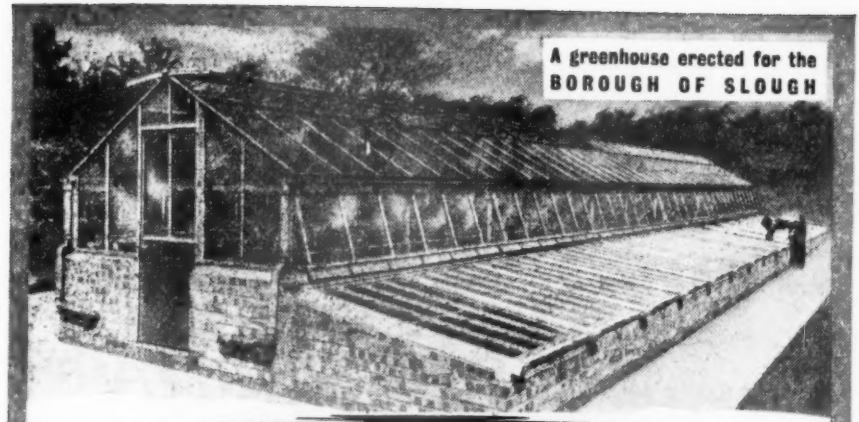

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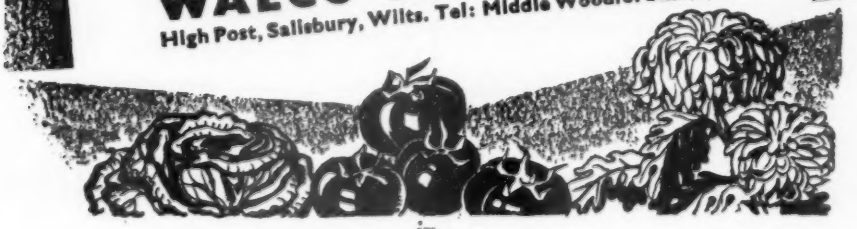

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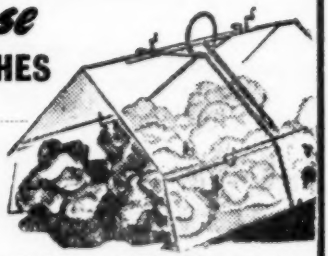

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JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

VOL. LXXXII PART NINE

September 1957

THE SECRETARY'S PAGE

ANNOUNCEMENTS—SEPTEMBER AND OCTOBER

Shows—The Shows are held in the Society's New Hall in Greycoat Street and/or the Old Hall in Vincent Square, Westminster.

FRIDAY, September 6 1 P.M. to 7.30 P.M. SATURDAY, September 7 10 A.M. to 5 P.M.	National Dahlia Society's Show, in both Halls.
TUESDAY, September 10 12 NOON to 6 P.M. WEDNESDAY, September 11 10 A.M. to 5 P.M.	Fortnightly Flower Show, in the New Hall.
FRIDAY, September 13 11 A.M. to 7 P.M. SATURDAY, September 14 10 A.M. to 5 P.M.	National Rose Society's Show. (Both Halls on September 13, New Hall only on September 14.)
TUESDAY, September 24 12 NOON to 6 P.M. WEDNESDAY, September 25 10 A.M. to 5 P.M.	Great Autumn Show, in both Halls.
FRIDAY, September 27 1 P.M. to 7.30 P.M. SATURDAY, September 28 10 A.M. to 6 P.M.	National Chrysanthemum Society's Show, in both Halls.
WEDNESDAY, October 2 12 NOON to 6 P.M.	Floral Arrangement Competition, in the Old Hall.

Shows—*continued*

TUESDAY, October 8 12.30 P.M. to 6 P.M. WEDNESDAY, October 9 10 A.M. to 5 P.M.	Fortnightly Flower Show, in the New Hall. Fruit and Vegetable Show, in the Old Hall.
TUESDAY, October 22 12 NOON to 6 P.M. WEDNESDAY, October 23 10 A.M. to 5 P.M.	Fortnightly Flower Show and Tree and Shrub Competition, in the New Hall.

Lectures

TUESDAY, September 10, at 3 P.M. "Growing Plants without Soil", by MR. D. FOXWELL.

TUESDAY, September 24, at 3 P.M. Masters Memorial Lecture. "The Water Requirements of Crop Plants in the United Kingdom", Part I, by MR. E. J. WINTER, M.C., M.SC.

TUESDAY, October 8, at 3 P.M. "Fruit-growing in the Amateur's Garden", by MR. E. W. HOBBIS, B.SC., N.D.H.

TUESDAY, October 22, at 3 P.M. "The Savill Gardens at Windsor Great Park", by MR. LANNING ROPER.

Demonstrations at Wisley—On September 25 there will be a demonstration on Digging, Manuring and Composting, commencing at 2 P.M. The demonstration will be repeated at the same time on September 26.

Lily Group Meeting—The Lily Group will hold a meeting in the Lecture Room in the New Hall on Tuesday, October 22, at 4.30 P.M., when there will be an exhibition of 35-mm. lantern slides.

The Society's Examinations—The Preliminary Examination for the National Diploma in Horticulture will be held on Saturday, November 16, 1957. The closing date for entry is October 1, 1957.

HONOUR FOR THE SOCIETY

THE greatest honour at the disposal of the Massachusetts Horticultural Society is the George Robert White Medal of Honor which was instituted in 1909 and is awarded annually in recognition of the accomplishment of important results in horticulture. It is therefore gratifying to be able to report that at their meeting in January the Board of Trustees of the Massachusetts Horticultural Society decided that the medal for 1956 should be "awarded to The Royal Horticultural Society, London, England, for its world-wide service for the advancement of horticulture. Through its flower shows, its bulletins, its year-books

and special publications, this distinguished Society has greatly enhanced the scope and art of gardening among amateurs and professionals. The expansion and development of the extensive plantings at Wisley is another manifestation of the Society's accomplishments."

The medal, which is illustrated in Fig. 118, is usually awarded to individuals, and our Society is the first organization of its kind to receive the distinction. The President, who spent some weeks in the United States this spring, was able to visit the headquarters of the Massachusetts Society in Boston to receive the medal.

WISLEY IN SEPTEMBER

N. K. Gould

SOME PLANTS IN FLOWER

As autumn approaches, a change comes in the character of the floral attractions of the Gardens, and while there is a less abundant display of flowers in the rock garden and borders the trials and standard collections of late-flowering herbaceous plants continue to provide plenty of colour and variety. While the beds and borders are still producing a mass of bushy and often untidy growth, the pale buds of the colchicums and the trim red scapes of the Belladonna lilies, suddenly appearing, suggest the advent of a new season. The long succession of crocuses also begins now with the pale orange-throated *C. kotschyanus* and the finely featured *C. speciosus*; and the little snowdrop-like *Leucojum autumnale* has a strongly vernal aspect.

The Belladonna lilies, together with another very decorative autumn-flowering bulbous plant, *Nerine bowdenii*, grow in the borders just inside the main entrance to the Gardens, but the most conspicuous object here is the Himalayan *Perovskia atriplicifolia*, of which two large bushes surmounting the wall outside the Curator's house have produced a cloud of lavender-blue blossoms. It has been established here for many years and its long roots have sent sucker-shoots through the face of the wall. A summer deluge of rain a few years ago caused the wall to collapse and one of the bushes was literally washed out of the soil. With some trouble it was restored to its proper place and suffered no check as a result of the disturbance.

An equally lovely blue-flowered shrub for a sunny situation is *Caryopteris clandonensis*, which grows in several places near the Laboratory and in other parts of the garden. Its neat, aromatic, grey-green leafage is pleasing all through the season, and contrasts effectively with the feathery inflorescences carried at the stem-tips. This chance hybrid between *C. incana* and *C. mongholica* has won the Society's highest awards. It is propagated easily by cuttings or seed, the seedlings showing some variation. The retaining walls are clothed in places with

mats of *Ceratostigma plumbaginoides*, which sends up annual shoots scarcely over a foot tall covered with clusters of bright blue flowers, while its underground rhizomes steadily, though persistently, extend its area. Its leaves assume a warm red or rusty hue as they fade. In the same genus are a few shrubby species, of which the rather tender *C. willmottianum* will grow and flower well from July onwards near a sunny wall, although its stems may be killed back to soil level in a hard winter.

At the west side of the Laboratory, in addition to the plants noted, the following should be flowering during September. *Abelia grandiflora*, a compact evergreen shrub with dark lustrous leaves, begins to flower in July and will continue into October with little tubular blooms of white or palest pink set off by purplish sepals. *Clerodendron bungei*, which grows beside the last-named, has much larger leaves and flattish heads of rosy-red flowers. The wood is soft and usually cut down by winter cold, but new shoots, often arising some distance from the old, will grow several feet and flower in a single season. *Campsis grandiflora*, the Chinese Trumpet-vine, snugly planted in a corner with a south-west aspect, climbs a low brick wall from the top of which its flowering shoots spread widely. In a favourable sunny month these display large orange-red flowers in quantity, but chilly nights can cause the buds to fall without opening. This rather rampant climber is kept within bounds by the annual pruning back of the shoots after the leaves have fallen.

One of the most uncommon flowering shrubs in the wild garden is *Cyrilla racemiflora*, the Leatherwood of the Southern U.S.A. The deciduous form grown at Wisley is perfectly hardy, and it is so attractive when covered with its 6-inch-long racemes of tiny white flowers that one might expect it to be more frequently planted. In the wild state its leaves are said to colour brightly before falling, but they do not do so with us. Another American species valued for its late flowers is *Oxydendrum arboreum*, the Sorrel-tree, which, like the *Cyrilla*, is the sole species in its genus. There is a tall columnar tree in the wild garden, most ornamental when bearing its 10-inch drooping white panicles of flower as its leaves begin to assume its rich autumnal coloration. A third monotypic genus of interest now is the Japanese *Disanthus*. The foliage, shaped like that of the Judas-tree, gives the species its name, *D. cercidifolius*, and the leaves are somewhat unusual in their autumnal tints, which include wine-red, scarlet and orange. The generic name was given in reference to the inflorescence, which bears two small, star-shaped crimson flowers back to back.

WORK IN PROGRESS

In the propagating department there is never a slack period, but at the present season preparation for next year entails a heavy programme of propagation. Cuttings of most of the plants used in the summer bedding, such as pelargoniums, heliotrope, abutilons and the varieties of *Chrysanthemum frutescens*, are being prepared now and planted, ten or

twelve together, in 5-inch pots in a mixture of loam, peat and sand. Certain plants used in the herbaceous borders but not sufficiently hardy to be left outside through the winter can economically be preserved under glass in the form of cuttings which by next spring will have produced young plants of convenient size. Such kinds as salvias and penstemons come to mind in this connection.

In the rock garden department cuttings of the gazanias are being planted. The collection of these brilliant South African composites, which in favourable summers are quite spectacular for many weeks, has been built up and maintained by selection and vegetative multiplication of the best of a large number of home-raised seedlings. It is found that cuttings taken in the autumn stand the winter better than old plants lifted from beds and potted.

On Battleston Hill many of the Bellingham hybrid lilies are being replanted at the present time. This is a group of plants of remarkable vigour and at Wisley it is found that after two or three seasons' growth they have formed dense masses of relatively small bulbs. This overcrowding is bound to lead to deterioration in the quality of the flowers, and the clumps of bulbs are accordingly divided into portions of reasonable size and replanted in beds of new compost 2 feet deep. The groups of narcissi which embellished the rhododendron trial beds were lifted in July and are now being replanted. A dressing of bone meal, which is very beneficial to them on the light soil in this area, will be applied before they are replanted.

TRIALS

In the Vegetable Trial Grounds visitors can see in progress trials of runner beans, climbing french beans and ridge cucumbers. There are fifty-two stocks growing in the trial of runner beans, including a number from overseas.

In the trial of dahlias no fewer than two hundred and fifty varieties are represented, this being the largest number for the past seven years. Twenty-five of these are bedding varieties. There are also well over a hundred different chrysanthemums, a quarter of which are of the pompon type. In the zinnia trial there are fifty stocks, all of which were entered from overseas sources, a few from France and Germany, the others from America.

GARDENING ON CHALK

Sir Frederick Stern, O.B.E., M.C., F.L.S., V.M.H.

(*Lecture given on June* 18, 1957, THE HON. LEWIS PALMER, F.L.S., V.M.H., *in the Chair*)

THE garden in the Chalk Pit started in 1909; when I was young I wanted a tennis court and as our house is situated on the side of the South Downs the only flat place was in the chalk pit. In this pit at that time there were a pigsty and some chickens, a few ancient apple trees and one or two ancient pear trees—in fact there was no garden at all, except a flower bed or two near the front door. The tennis court was finished in 1910—then it seemed to us the pigsty and chickens and refuse dump were not pleasant surroundings to the tennis court. Two friends, both keen gardeners, the late SIR ARTHUR HILL and the late ROBERT WOODWARD of Arley, encouraged me to try and see what would grow on this chalk soil without making up any special soils.

We found after a number of trials that if the chalk was broken up to a depth of about 2 to 2½ feet most of the plants that did not mind lime would grow perfectly. If a hole is made in the hard chalk and a tree or shrub is planted there, it eventually gets pot bound as the roots cannot spread into the hard chalk, but if the ground is broken into rubble the roots can get away and the plant will flourish. There is much to be said in favour of chalk; when broken up there is excellent drainage and the rubble chalk holds the moisture; in any dry spell if one digs down a spit it will be found that the bits of chalk are quite moist like a sponge.

No one would tell us what grew on chalk so we tried everything. Then we had a bit of luck. WOODWARD and I took a share in FARRER's first expedition to North-West China in 1913. Seed came back in 1914. I was away from 1914 to 1918 but my good gardener, JAMES BUCKMAN, raised the plants while I was away. We found that most of the plants from China, other than the ericaceous plants, grew well on this soil so we concentrated on Chinese plants. We were able to buy a number of young plants of ERNEST WILSON's collecting, such as *Magnolia delavayi*, *Acer griseum*, *Davidia vilmoriniana*, *Viburnum rhytidophyllum* and others, which have grown well. FARRER was a great gardener and the plants he collected in Kansu were nearly all first-rate garden plants and hardy, such as *V. fragrans*, *Buddleia alternifolia*, *Carpinus turczaninowii*, *Gentiana farreri*, *Lilium leucanthum* var. *centifolium* and *L. duchartrei*, and many others. Since those days we have raised plants from China and Tibet collected by FORREST, KINGDON WARD, and LUDLOW and SHERRIFF. Of course, it is no good trying to grow rhododendrons or azaleas or most other ericaceous plants. There are, however, a few ericaceous plants that have no objection to lime, such as the Arbutus family and three ericas, *E. carnea*, *E. mediterranea* and, best of all, *E. terminalis*, from Corsica. This heath, which becomes a bush about 3 feet high with pink

flowers, grows perfectly on the chalk cliff, even seeding itself there. We find that most of the plants that grow wild round the Mediterranean, where the soil is largely lime, will do well in our chalk.

Our object in the garden is to try and have flowers out all the year round. The plants coming into flower in early spring are the greatest joy, so we have concentrated on them. All the bulbs and corms like our drainage and seed themselves into a mass. The species crocus such as *C. aureus* and *C. tomasinianus* seed themselves in all directions and make a splendid carpet in January. At the same time, if the weather is good, the first daffodil comes into flower, the deep yellow *Narcissus bulbocodium romieuxii* which is charming in a pocket in the rock garden facing south. We found this daffodil on top of the Middle Atlas Mountains, in Morocco, coming into flower there in early April just as the snow on the mountains was melting. Daffodils nearly all enjoy the good drainage and are great fun, both the tall garden varieties and the small species; the only exception is *N. cyclamineus*, which does not like our soil and requires one damper and more acid. The small and more delicate species and hybrids like *N. rupicola* and *N.* 'Hawera' and many others are fascinating and great favourites of ours. In January the snowdrops begin. *Galanthus rizehensis* and *G. graecus* are the first to flower in the new year; they both seed themselves, eventually forming a mass. We try and keep the different species well apart, otherwise they are apt to cross with each other and one gets too many hybrids. The early form of *G. caucasicus* comes out at the end of January. There are many attractive snowdrop forms or hybrids; one of the most charming is 'Magnet', where the flowers hang on a long pedicel so that they are always moving fairy-like in the slightest breeze.

Now the winter aconites cover the ground in shady places, coming into flower before the Christmas roses begin. The larger-growing *Eranthis tubergenii* seems to enjoy a sunny place where it increases, whether by seed or offsets we have never discovered.

The earliest Christmas rose, *Helleborus niger*, is charming with its white flowers; the form known as 'Ladham's variety' is the most robust with flowers of substance which are not so liable to be damaged by bad weather as some of the other forms. *H. orientalis* comes out later, making a fine show with flowers varying in colour from white to pink and dark mahogany. They seed in the chalk soil, flowering over a long period and seeding themselves freely. *H. corsicus* is an attractive plant, but a hybrid raised here, *H. corsicus* with the not too hardy *H. lividus*, is a strong-growing plant with the large substantial leaves of *H. corsicus* and pale pinky flowers after the style of *H. lividus*; the Kew people have honoured us by calling this hybrid *H. sternii* in the *Botanical Magazine*.

Some thirty-five years ago a kind friend, S. C. ATCHLEY, who lived in Greece, used to send us bulbs and corms of their wild flowers. Among these were the lovely Greek anemones which all like this lime soil. The deep blue *Anemone blanda* var. *ingrami* seeds itself everywhere and makes a glorious mass of colour in March. Another delightful one is

A. pavonina, whose flowers come all sorts of colours, red, pink and quite light buff-yellow. This anemone seeds itself on the grass paths and looks enchanting. We call it our Persian carpet with all those gay colours on their background of green. The deep red *A. coronaria* comes out a little later. There are a number of delightful forms of our native wild wood *A. nemorosa*, white, large white, light blue, and some with the outside of the petals pink; the latter looks very pretty with *Fritillaria meleagris alba* growing through it, as they both flower at the same time. The European fritillaries have no dislike of lime, from the large red *F. imperialis* to the tiny *F. armena*, only 3 or 4 inches high with its comparatively large mahogany-red flowers, a great favourite. *F. tubiformis* var. *moggridgei* is also an amusing one with its chequered yellow flowers on its 8-inch stem. All the different forms of *F. pyrenaica*, which have flowers varying in colour from deep nearly black-brown to quite bright yellow, are growing in a dampish border mixed up with *Galanthus byzantinus* which comes out early, followed by the small light yellow daffodil 'W. P. Milner', after which come the fritillaries, then the bright red *Tulipa sprengeri*.

Anemone apennina comes out later and makes a mass of white and blue flowers in shady places under shrubs. The Pasque flowers, now named *Pulsatilla vulgaris*, enjoy this soil and are lovely in flower and decorative in seed. There are a number of fine forms, some deep violet blue, some red, and a fine pink form and later a yellow-flowered form known as *Anemone caucasica*.

In the rock garden *Jeffersonia dubia*, one of the most beautiful of all rock plants, is lovely in March when covered with a mass of light blue flowers. *Iris winogradowii* is now in flower; it is the yellow counterpart of the blue *I. histrioides* which flowers somewhat earlier. Seed of *I. winogradowii* was sent us years ago by the Tiflis Botanical Garden and took some years to come into flower, but it is easy to grow and divides quite satisfactorily.

Only a few of the primulas are really happy on our chalky soil, but some of them, like *P. rosea*, seed themselves all around the damp places near the pond, making a splendid show when in full flower. This is followed by the bright yellow *P. prolifera*, the fairly new introduction from Assam, a charming plant which also seeds itself in damp places. Later *P. helodoxa* comes out, even growing with its roots in the water, and, of course, KINGDON WARD's *P. florindae*, a useful late flowerer.

Staphylea holocarpa rosea, one of ERNEST WILSON's introductions, now about 30 years old, is covered with delightful pink flowers in early April before the leaves appear and is of value, coming out before most of the cherries begin. All the cherries do well on the chalkiest ground. Many have been planted and it is difficult to say which is the most beautiful, but mention must be made of *Prunus* 'Tai-haku', the large-flowered white, and the later flowering *P.* 'Longipes', and one of the latest, *P.* 'Alba-rosea', now known as 'Shirofugen', which makes a truly lovely tree. All the species clematis that we have tried like our soil but we have

never been successful with the large-flowered hybrids, which seem to do best on a less limy soil. *Clematis armandi* grows luxuriantly and is splendid when covered with large white flowers in early spring. It seeds itself freely and hates being trained, so we let it go where it likes. FARRER's *C. macropetala* with its shaggy blue flowers is charming and also the strong-growing *C. montana*. We think the finest pink is *C. spooneri*, also a tremendous climber. The light blue and white forms of *C. alpina* are very charming and much neglected plants in gardens.

In April many of the bulbs are in flower; the white *Leucojum aestivum*, the 'Gravetye variety' given us by WILLIAM ROBINSON, is a splendid plant for the border, tall and strong; although in the wild this leucojum appears to grow in or near wet places in the garden it does perfectly in the border. We are fond of the tulip species, which mostly flower in April. *Tulipa saxatilis* likes us and flowers profusely, the flowers pink with a yellow base (Fig. 116); it runs about making stolons underground. The yellow *T. sylvestris* also increases by stolons and flowers well; the form grown here is said to be the Persian form which seems to flower more freely than others. A number of dwarf species such as the yellow *T. batalini*, and scarlet *T. linifolia* and the light pinky-red *T. aucheriana* are perfect for the rock garden, where *Ramonda nathaliae* is now in flower. Of the genus this ramonda does best, increasing rapidly and making a mass of mauve-red flowers.

Lilacs like the chalk: all the large-flowered hybrids such as the deep red 'Massena', the white 'J. C. van Tol' and the light mauve 'Maréchal Foch' and many others make big plants. There is much to be said for the species, whose flowers are more delicate and have a charm that some of the large-flowered forms lack; *Syringa sweginzowii*, with light flesh-coloured flowers, and *S. potaninii*, with white ones, are delightful and are both sweetly scented. There is a hybrid of MISS PRESTON's raising, *S. josiflexa* 'Bellicent', with delicate pink flowers, which has the grace and charm of the species. The dwarf species *S. palibiniana*, which, according to REHDER, should now be called *S. microphylla*, is useful in the herbaceous border. We like to put the low-growing shrubs such as the shrubby potentillas, the small "old-fashioned" roses and other low-growing shrubs among the delphiniums, paeonies, hollyhocks, verbascums, eremurus, crinums and others in the herbaceous borders.

The paeony species flower from April to June. *P. cambessedesii* is the earliest to flower but is apt to get cut by late frosts, so is best put in a sheltered place near a wall. The other April-flowering species is the Moroccan *P. coriacea*, which is quite hardy in the open. This paeony was a wonderful sight in a wood on the Middle Atlas Mountains with dozens of plants in full flower in April. The yellow-flowered species from the Caucasus, *P. wittmanniana* and *P. mlokosewitschi*, are most attractive. These are followed by *P. emodi*, which makes a large plant about 3 feet high and is covered with single white flowers. All the red-flowered species such as *P. mascula*, *P. daurica* and *P. humilis* var. *villosa* are in flower in May. Our hybrid 'Emma', the cross between

P. emodi and *P. mascula*, is a strong grower with large white flowers and looks like making a good garden plant. The finest red-flowered species which comes out now is *P. anomala* var. *intermedia* from the Ural Mountains.

Towards the end of May the tree paeonies begin. Most of them are planted among deciduous trees in half shade. In such positions they grow well and the flowers last longer; also, the early growth comes later, so avoiding the late frosts and cold east winds. *P. suffruticosa*, the wild species which was sent home by DR. J. F. ROCK from China, is now about twenty years old and has become a large plant about 9 feet high and 10 feet in diameter. About the end of May it is covered with large white flowers with a deep red marking at the base of the petals. There is no doubt about the hardiness of this paeony as it grows well on the top of the rock garden in the Botanic Gardens at Stockholm. Two fine tree paeony crosses made by the late PROFESSOR SAUNDERS of New York are the single yellow-flowered 'Argosy' and the deep red 'Black Pirate'. There are a number of seedlings of ours such as the light pink 'Cassandra' and the deep pink 'Mrs. George Warre'. All these paeonies are worth growing and when they make large bushes covered with flowers they are all delightful.

At this time that unique tree *Davidia involucrata*, now over 20 feet high, is covered with the large white bracts hanging all over it, quite unlike any other tree. The first of the eremurus begins to flower at the end of May; the pink *E. elwesii* (Fig. 111) and the white *E. himalaicus* are excellent plants for the back of the border growing about 5 feet high. The hybrids between *E. bungei* and *E. olgae* which we have been raising from seed for the last thirty years come into flower later in June. They are of many colours, pink, orange, yellow, and white, and are a grand sight when in full bloom. *Schizandra rubiflora* is a strong climber growing up the wall of the potting shed and is splendid when covered with hanging deep red flowers at the end of May.

Only a few of the magnolias have done really well on this hot dry soil. *Magnolia delavayi* has grown into a very large plant on the wall of the house but the flowers are disappointing, short-lived and comparatively small, though the large leaves are magnificent. *M.* × *highdownensis*, which is said to be a cross between *M. sinensis and M. wilsonii*, grows splendidly and is covered each year with its hanging flowers. *M. sinensis* also does well and the only other one that has grown into a large tree is *M. kobus*. None of the American magnolias are successful, in fact the only North American shrubs and trees which will tolerate the lime are those from the west coast. *Cornus nuttallii*, a slow grower, is now some 15 feet high and is attractive with its white flowers in April, and later in June *Carpenteria californica* is full of flowers. This plant has grown in the open border for some thirty years and is a large bush; after a severe winter it looks unhappy but comes round perfectly when the warmer weather arrives.

Wisteria floribunda macrobotrys has made a bush and is very beautiful

with its long racemes of white flowers. The hardy forms of the New Zealand shrubs and trees such as pittosporum, veronicas, olearias and senecios have no objection to the chalk. The finest New Zealand plant grown here, *Nothospartium carmichaeliae*, the Pink Broom, has grown into a large bush on the wall of the greenhouse and is quite magnificent in July when in full bloom covered with deep pink flowers.

All the European and the Asiatic mainland species of iris are quite happy on the lime soil. The American species like *Iris innominata* and the Californian species like *I. bracteata* and *I. douglasiana* will not grow, nor will the Japanese irises like *I. gracilipes* and *I. kaempferi*. Most of the other species and, of course, the garden hybrid iris enjoy the lime. *I. unguicularis* (syn. *stylosa*) begins to flower at the end of October on a hot dry sunny chalk bank and goes on to the end of February when the Greek form of this Iris comes into flower; this form has shorter leaves and flowers of a deeper blue. In April the Juno irises flower; there are a number of different species: *I. bucharica* with white flowers and *I. orchioides* with orange-yellow flowers, also *I. graeberiana* with light violet flowers, and the tallest, *I. magnifica*, with white flowers tinged with lavender. At the end of the month some of the *Evansia* section are in flower; *I. japonica*, which by the way is indigenous to China, and *I. confusa*, which used to be called *I. wattii*, are quite hardy and go on flowering for a long time; *I. confusa* is also useful as a cut flower. *I. tingitana* var. *fontanesii* grows on the chalkiest ground and the deep violet-blue flowers come out at the same time as the white flowers of *Pancratium maritimum*. Later *I. laevigata*, a close relation of *I. kaempferi* but coming from Manchuria, is charming with its blue and white flowers in damp patches by the pond in front of our native wild iris *I. pseudacorus* var. *bastardi*, a form with golden yellow flowers, a great improvement on the ordinary type. Then *I. chrysographes* and its different coloured forms, some purple-red and some nearly black, mostly from KINGDON WARD's collecting, flower in damp places, and lastly all the different species of the *Spuria* section, the golden-flowered *I. aurea* and one of the prettiest the light blue *I. spuria* var. *lilacina*. This is just a short résumé of some iris species which we like so much and which do so well on this chalky soil.

The rose species, the floribundas and the so-called "old-fashioned" roses do better on this soil than the hybrid teas, although some of the strong-growing hybrid teas do quite well. The season begins with the double yellow *Rosa banksiae*; nothing is so pleasant as picking the little bunches of yellow flowers outside one's bedroom window in early April. This form and the single white are strong climbers; they should be pruned directly after flowering to get a good crop of flowers the following year. *R. primula* is the first of the bush species to come out; it makes a large bush and is very pleasant when covered with yellow flowers. The leaves scent the garden all around it during the whole of the summer. At this time the beautiful *gigantea* hybrids 'La Follette' and 'Senator Amic' are in flower on a south wall, and also the deep red

single flowers of 'Ramona', a hybrid of *R. laevigata*, make a fine show on a south wall growing up over the roof of the stables. A number of roses come into flower at the end of May; *R.* 'Nevada' makes a round bush about 5 feet high and is covered with single cream flowers, and *R. farreri* which BOWLES called the threepenny-bit rose, is delightful with its many little pink flowers. Soon after this *R. chinensis mutabilis* begins to flower. This species makes a bush about 5 feet high and is in flower the whole summer, being the last rose species to go out of flower. The name comes from the changing colour of the flowers, opening pink and dying a deep red. *R. brunoni*, of FARRER's collecting, makes a large bush and is impressive when covered with white flowers in July; it seeds itself about and one self-sown seedling has made a large bush on the chalk cliff. A charming rose, a French hybrid 'Nathalie Nypels', which may be counted among the floribundas, has been growing here for over twenty years and each year has charming pink flowers which continue till the frosts. We are very fond of the "old-fashioned" roses, of which different ones are in flower all the summer. Many of them such as the old cabbage rose and 'Celestial' have the sweetest scent; 'Fantin-Latour' and 'Souvenir de St. Anne' are particular favourites and make good bushes. There are many different sorts and they are all attractive.

We are often asked what lilies will grow on lime soils. Of course there are very different lime soils; some are soils with some lime, but others, such as ours, are full of a great deal of chalk; in fact, in no part of the garden is the pH under 8. In this highly calcareous soil, *Lilium testaceum* has grown well for many years and also the fine hybrids of *L. testaceum* with *L. chaldedonicum*, created by OLIVER WYATT, called 'Apollo' and 'Hephaestus', very lovely plants with orange martagon-like flowers. *L. martagon*, both the red and white forms, has done well for many years. *L. leucanthum* var. *centifolium* and *L. duchartrei*, both raised from seed from FARRER's Kansu expedition in 1913, grew and flowered beautifully for some twenty years till they were lost in the difficult years of 1939 to 1945. Some young plants of both these lilies are now replanted. Neither had an objection to the lime. *L. regale* does well and when grown through lavender is extremely effective. The lavender protects the early growth of the lilies, and the flowers of both come out together making a successful combination. One of the latest hybrids, *L.* 'Enchantment', seems to be quite happy in this soil; the colour of the flowers of this lily is unique, a sort of salmon-red. The lily which will grow well on the chalkiest ground is *L. henryi*. MONSIEUR DEBRAS of Orleans made a cross between *L. henryi* and *L. sargentiae* which he named *L.* × *aurelianense*, after his home town. He gave us an offset of this lily about twenty years ago and it has grown and increased ever since. We have been breeding from this hybrid by back-crossing it with its parents and also selfing it and find that when it is back-crossed with *L. henryi*, or a hybrid of *L. henryi*, one gets strong plants which have no dislike of lime, but when crossed with the other parent, *L. sargentiae*, the hybrids will grow for some years and then deteriorate.

The most successful lilies are those raised from selfed seed of *L. aurelianense*. The best we call 'Ava', growing about 5 feet high with a large head of about ten to twelve white open-trumpet flowers with a slight yellow base on the inside of the petals. Most of these lilies flower at the end of July and beginning of August, a welcome time for flowers in the garden.

Most of the rock plants have no dislike of lime. The little aquilegias, like *A. bertoloni* and *A. discolor*, are fascinating with their rather large flowers on 3-inch stems. *Anthericum liliastrum*, St. Bruno's lily, now, I understand, put in the genus *Paradisea*, is very effective with its tall stems and mass of white flowers. Another rock plant which we are very fond of is *Convolvulus mauritanicus*, full of light blue flowers in July and August. In the later month *Cyclamen graecum* begins to flower on the rock garden in a hot sunny place and is delightful. This is the one cyclamen species which seems to need a really hot sunny place. The corms were sent us from Greece many years ago and were said to grow in such positions usually wedged under the rocks. Here they have flourished for many years and seeded themselves.

In August the New Zealand hoherias come into flower and are quite hardy, growing on the chalkiest soil. *H. populnea* is now some 30 feet high and is covered with white flowers. Another splendid August-flowering shrub is *Hydrangea villosa*, one of FORREST's introductions from China with fine blue flowers. The only other hydrangea which will tolerate the chalk is the pleasant small *H. involucrata*. *Clerodendron fargesii* is a small tree with delightful, white, sweet-smelling flowers in August and steel-blue berries later, if the birds allow it.

It is rather surprising that all the kniphofias will grow in this chalk soil even on the chalk rubble of the cliff. They are attractive and useful plants, many of them coming into flower in the late summer. One we like very much is *K. snowdeni*, which comes from the highlands of Uganda and is quite hardy with golden and red flowers most of the summer.

In late summer and autumn many of the bulbous plants come out. The white *Crinum powelli* is lovely and the pink form is fine, but not so lovely as the white. *Nerine bowdenii* does well and with the white *Zephyranthes candida* make a pleasant combination. The colchicums are later in flower and then the true autumn crocus *Cyclamen neapolitanum*, both the red and the white forms, make a mass in half-shady places. This cyclamen is one of the most delightful autumn flowers which gives no trouble, needs no looking after and seeds itself freely.

The first, or is it the last of the snowdrops, *Galanthus nivalis reginae-olgae*, comes out at the beginning of October, the flowers coming before the leaves appear. The next snowdrop species to flower is *G. corcyrensis* and is a most punctual plant, always in flower in the garden on November 10. The difference between the snowdrops is that the former flowers without any sign of leaves and the latter always has the leaves just showing when the flowers open. These snowdrops, which come

from Greece and Corfu, keep their autumn-flowering habit in cultivation.

In November *Mahonia lomariifolia* has bunches of stiff spikes of golden yellow flowers, each spike about 6 inches long, and if the weather is kind they last a long time. This tropical-looking plant with large leaves, which comes from Northern Burma, was raised from seed and has gone through several severe winters without hurt. The plants are now about 6 feet high.

The best colouring maple in the garden is *Acer griseum*. The leaves turn a wonderful colour of bronze-red and gold in the autumn and it is attractive all the year round with its brown-red peeling bark.

We are very fond of all the different berrying shrubs and trees which add so much to the decoration of the garden in autumn. On the chalk cliff *Cotoneaster horizontalis* and *C. conspicua* var. *decora* seed themselves; their red berries and the scarlet leaves of the former and the yellow-red leaves of *Rhus typhina* make a riot of reds and yellows in autumn and show up splendidly against the chalk background.

We found that any number of plants grew splendidly on this chalk cliff. All the cistus and helianthemums, all the junipers, *Cytisus battandieri* (though *C. alba* and all its varieties do not like it), hoherias, cherries, *Arbutus unedo*, *Genista cinerea*, *Spartium junceum*, all have made large plants. *Paeonia lutea* var. *ludlowii* was put on the rubble of the cliff by mistake, thinking when we first raised it that it was *P. lutea*; it has grown wonderfully and is now over 6 feet high and fine when the large butter-yellow flowers appear above the leaves. The Scotch roses and *Rosa rugosa* do well. *R. brunoni*, as I said before, has seeded itself in the middle of the cliff and is now a vast plant. It seems that the more the cliff gets covered, the more seedlings appear. Among those that seed themselves and have to be kept in check are *Viburnum rhytidophyllum*, the evergreen oaks and of course the buddleias. *Euphorbia wulfenii*, with its lovely green flowers in April and May, seeds itself. Our mistake was to put in St. John's Wort, which has become a nuisance and is difficult to eradicate. The only plant that can compete with it is the Spanish gorse. At the back *Cupressus lusitanica glauca* has made a large specimen. At the top of the cliff to protect us from the north wind are *C. macrocarpa* and the Corsican pine, which seems to be the best pine for thin chalk soils.

On the Down at the back of the house there are many fine berrying plants; cotoneaster 'Watererii' with its wonderful scarlet berries, *C. franchettii* var. *sterniana* with its yellow and red berries, *Viburnum betulifolium* and *Euonymus grandiflora* have all made large plants and make a fine display in autumn, together with the different berrying sorbus. To our surprise *Metasequoia glyptostroboides* has grown into a tall plant on this dry place.

Then at Christmas one of the most delightful of all the prunus species, *P. subhirtella* var. *autumnalis*, comes into full flower.

THE MODERN DELPHINIUM

Ronald Parrett
(Co-editor, The Delphinium Society's Publications)

(*Based on an illustrated lecture given on July* 2, 1957, STUART OGG, ESQ., *in the Chair*)

IT is sometimes astonishing to reflect that the beautiful blooms we admire at Chelsea and elsewhere have sprung from wild delphiniums such as *Delphinium elatum*, *D. formosum* and *D. cardinale*, but so it is. Chief credit for the original work of hybridizing seems to belong to M. VICTOR LEMOINE of Nancy, and it was his hybrids which laid the foundation of the noteworthy success achieved by JAMES KELWAY. After the turn of the century the Bath firm of Blackmore & Langdon commenced work on the plant, basing their beginnings on the best from both LEMOINE and KELWAY, and shortly afterwards they were followed by B. RUYS in Holland and KARL FOERSTER in Germany.

Following World War I, WATKIN SAMUEL of Wrexham, CHARLES BARBER of Oregon, FRANK REINELT of California and FRANK BISHOP entered upon the scene. There have been many others, of course, all contributing something of value from time to time, but it is I think fair to say that the leading breeders so far as the British gardening public is concerned are, firstly, Blackmore & Langdon, with FRANK REINELT and his Giant Pacific seed strain fulfilling the unique function of offering to gardeners the world over seed to colour in twelve varieties, and, lastly, FRANK BISHOP, who married the two strains mentioned and evolved the Bishop strain and the new Commonwealth strain from that union.

Up to the end of World War II world progress in delphinium breeding had not been exactly slow, but in the twelve years since the war it has been so rapid that the process of publication almost has to be speeded up in order to maintain topicality! It is a simple matter, at the time of writing, to select a dozen well-tried British named varieties, covering a colour range and of a quality quite unknown a short twelve years ago. Likewise with the seed of the Giant Pacific strain, results from which are undergoing similar annual improvement.

THE MODERN SPECIFICATION

So much for the speed of progress! Let us now see what this means to the gardener of today in terms of plants easily grown.

Height. For the greater part of its existence the delphinium has been looked upon as a tall plant. For so many years it was considered really suitable only for the largest borders, and that so often meant only for the largest gardens. Height came to be one of the main criteria, and still remains so in the minds of thousands of gardeners today. Yet how completely wrong they are, for it is not mere height that counts, it is surely the length of the bloom! And it is in that very respect that the breeders have scored their principal success.

We used to have to look *upwards* to see our delphiniums (and incidentally had the devil's own trouble in keeping them upright!), but now we can look *down* on many and can look all the others squarely in the eye! Total height varies from 3 feet 6 inches to 6 feet 6 inches, *but more than half the height is colourful flower*. The display of colour is much increased and brought down to a level where it can be enjoyed and properly set off even in the smallest garden.

Colour. Once you have brought your plant down to sensible proportions, the most important quality is then colour. Of course, albinos have occurred from time to time in many gardens; LEMOINE'S 'Statuaire Rude' was heliotrope in colour, and KELWAY'S 'Primrose' of 1890 was well named. Such departures from the then normal have however been short-lived and right up to about 1930 the delphinium was always in the blue/mauve/purple range.

Nowadays the blues are sharpened and purified, the purples enriched, and added to them, in plants of the utmost vigour both from seed and named, are white, cream, palest lavender, heliotrope, and Parma violet. In less-vigorous plants, but easily raised from seed, you may also have a range of pink from blush to raspberry-red.

The other factor which greatly affects the appearance of the spikes is the "eye" or "bee". The colour and shape of these varies tremendously and can greatly enhance the beauty of the flowers. These new "bees" have been bred by FRANK REINELT; variations of pleasing form are readily obtainable in all Giant Pacific seedlings, and are also occurring increasingly in the latest Bishop and Commonwealth named varieties and in seedlings of the Bishop strain.

Florets. Apart from the fact that 3 inches and 4 inches is now becoming quite common, the main improvement of garden value is the way in which the petals stay on the bottom flowers until the top ones are open. This has doubled the value of the delphinium to the owners of small gardens, and curiously enough it is due to increased substance, or thickness, in the petal itself. Whilst the single-petalled floret so common at one time has passed out of fashion, it is a fact that it had much less substance and set seed too speedily, thus dropping far too soon. It is now quite common to see the seed pods protruding through the eye, with the petals still giving a good display; indeed, with many of the white ones the petals do not drop at all but wither on the spike.

Stems. The coarse stem of "punt-pole" dimensions has given place to something slim and elegant, with more whip in it, more readily hardened by the sun, and so altogether more suited to the wind and rain which has earned these plants such a bad reputation at times.

Seed. The big discovery in this field is the fact that refrigeration of the ripened seed at about 40° F. will preserve the viability for up to ten years and more. Stored in ordinary household or seed-store conditions, this seed deteriorates rapidly and commonly gives as low a germination as 20–30 per cent in springtime, thus again earning this lovely plant an undeservedly bad name. Refrigerated seed obviates disappointment!

Slugs. Last autumn and winter were almost the worst since the war for slug damage and those who neglected their plants last winter had all the main "eyes" eaten out by these pests. The whole virtue of controlling the slug population lies in doing so at the "egg" stage; this can only be done with a contact killer containing either alum soda or sulphate of aluminium and safe proprietary brands are available. The watering of these into the crowns from late autumn to the commencement of growth in spring provides the most effective control possible. Attractive poisons are of course quite useless at this stage because the "eggs" can neither move nor eat.

Mildew. It is no longer necessary to have to contend with this unsightly disease. There are now available dozens of named varieties which are mildew-resistant, many completely so. With seedlings, too, the great majority show freedom from mildew.

Flowering season. The Giant Pacific plants flower earliest of all and a good proportion of the Blackmore & Langdon strain flower exceptionally late. A judicious planting, using all three strains and using borders facing north as well as borders facing south, should give colour for at least ten weeks.

Increase of selected stock. Proper instruction by word and picture is given in the publications of The Delphinium Society. This makes it quite clear that spring cuttings of the young shoots 3 to 5 inches long afford the healthiest and quickest means of increase of a selected seedling or a valuable named plant. Division, entailing inevitably the replanting of dead matter as it does, is to be deprecated.

THE STRAINS AND THEIR VIRTUES

In the foregoing paragraphs I have outlined the broad details of the wonderful work the breeders have done on this plant. The three strains with which we are mainly concerned have been bred with entirely different objectives, and in my view complement each other to give the would-be grower everything he or she could possibly want. It is interesting to remember that seed of the Blackmore & Langdon strain has provided the foundation for the Giant Pacific seed strain and that plants of the same strain gave FRANK BISHOP his original breeding stud. Thereafter, three different roads to success have been followed by the three breeders.

Blackmore & Langdon. The outstanding consideration here has all along been vigour and constitution, with selection and vegetative propagation in order to offer named plants. Whilst the seed available has been, perhaps, a secondary consideration, it does of course offer similar qualities to the named plants and reflects the general improvements in breeding—late-flowering, mildew-free varieties are a valuable feature. In colour range, the silvery mauves and amethysts are predominant—as typified by that magnificent plant 'Silver Moon'. I place the plum-purples next; these are a very strong set of plants, ranging from 'Tyrian' at 4 feet 6 inches to 'Guy Langdon' at 7 feet (with 4 feet of

bloom!). In light blue with pale rosy flush or veining there is a very attractive set in 'Mazurka', 'Anona', 'Geoffrey Eley' and, latest of all, 'Sea Mist'.

All these that are mentioned are in my view the finest plants available anywhere in their colour classes. Additionally this strain affords all the intermediary combinations of blue and mauve and also many good blues such as 'Charon', 'Blue Rhapsody', 'Ann Miller' and 'Côte d'Azur'.

Giant Pacific strain. With FRANK REINELT the breeder's objective has been to separate and fix the colours so as to offer seed to colour. This course was forced upon him by the Californian climate, which only allows plants a dormancy of four weeks after a long growing season with three periods of flowering. This entirely precluded selection and propagation of individual plants, and so perenniality has played no part in his breeding or selection.

Another of his aims has been to rogue and rogue in order to promote a seed strain which would grow fast and flower early from seed, and that very virtue has fitted his plants well for the British season, providing delphinium bloom when no others are available.

Perhaps it will be of interest to note briefly the method he follows in fixing a colour. Starting from scratch he selects and crosses two plants of similar colour and high quality. From the resultant sowing he raises 500–1,000 seedlings, narrowing the selection to the two best and allowing these plants to self themselves. Carrying on in similar rotation, each season sees the colour intensified by the crossing and the undesirable characteristics dropped out by the selfing, with a very uniform seed strain emerging at the finish. In order to maintain the colour and to prevent the inbreeding of sterility, MR. REINELT still finds it essential to alternate between selection and hand-pollination in the one year and self-fertilization in the next. The colours at present fixed are as follows:

Seed series	*Colour description*
'Galahad'	Pure white, white eye
'Percival'	Pure white, black eye
'Lancelot'	Pale heliotrope, fawn eye
'Guinevere'	Rosy-lavender self, white eye
'Cameliard'	Bi-coloured lavender, with white eye
'King Arthur'	Rich plum purple, white eye
'Black Knight'	Deepest royal purple, black eye
'Summer Skies'	Light blue, creamy white to yellow "bee"
'Blue Bird'	Mid-blue, white eye
'Blue Jay'	Dark blue, black eye
'Astolat'	Various shades of pink from blush to raspberry, with "bees" of black, brown, fawn, and white.
'Elaine'	Soft pinks with light-coloured "bees"

For purity of colour these strains are justly famous. The colours are strikingly clear and sharp. Whilst FRANK REINELT used *D. cardinale* in his unsuccessful search for a scarlet hybrid, its effect was to make many of the other colours much sharper and more luminous, particularly the blues and purples. The 'Black Knight' series gives purples of unrivalled depth and richness, and the sharp blues of 'Blue Bird' and 'Blue Jay' are really in a class of their own. Most of the plants are very vigorous, the only really weak ones over here being 'Astolat' and 'Elaine', while 'Galahad' is variable. With the increased period of winter rest in Great Britain these seedling plants show a high percentage of perenniality when well cultivated. It is also a valuable asset that these plants flower so early because they almost invariably give a second crop of bloom which comes in August in a normal season, thus increasing the flowering season from ten to thirteen or even fourteen weeks.

For those who have strong likes and dislikes on the subject of colour and who do not wish to afford the named British varieties, these strains offer a unique opportunity because they do come 90 per cent true from the raiser's seed. As to form, spikes can have two faults in floret placement; they can be too tight, with consequent loss of individual beauty, and they can be too widely spaced. Many of the Pacifics are ideally spaced, but some are rather loosely built; this is definitely the lesser of the two evils, and this looseness appeals to many who do not like the heaviness and stiffness of the close-knit spike.

A further and very valuable garden quality, originating in the Vanderbilt strain with which FRANK REINELT also worked, is the slim, hard but whippy stem which is so weather-resistant.

Bishop strain. FRANK BISHOP'S great aim was to breed a clear-blue 'Silver Moon'—that is, blues as good as the very fine silver-mauves of the Bath strain. To this end the breeder was ready to experiment freely; he used Giant Pacifics for breeding purposes, and it is as certain as anything can be that such varieties as 'Agnes Brooks' and 'Mrs. Frank Bishop' owed their startling blueness to American blood. Stocks of these plants have been variable, but the same can no longer be said of later introductions such as 'Moonrocket', 'Nora O'Fallon' and 'Jack Tar', and these are verily the bluest of the blue.

A further Bishop achievement of some moment was the introduction of such sturdy and short-growing varieties as 'Blue Pearl', 'Betty Baseley' (both true blue), 'Cinderella' (heliotrope) and 'Janice' (pure white, white eye). Indeed, this great delphinium-lover added many new colours to the range of British perennial named varieties, such as 'Swanlake' (white with black eye), the heliotrope of 'Dame Fortune' and 'Cinderella' and the Parma violet of 'Minstrel Boy' and 'Supreme', and without eventual loss of either constitution or perenniality.

On the subject of his successful pursuit of perennial pure blue, it is probably true to say that the Bishop blues owe their sharpness and luminosity to the recurrent effect of *D. cardinale*, mentioned previously.

Commonwealth strain. This last achievement of FRANK BISHOP'S

is the stop-press news of the delphinium world. Whilst as yet none of us know how these plants will perform in our gardens, we do know what they look like. They have all the new shades of heliotrope coupled with particularly pleasing "bees", yellow, fawn and coffee-coloured, and they include new colours in pure cream with yellow eyes which are particularly pleasing, and in the palest pastel shades of creamy white shading to pale lavender at the petal edges.

Florets are very large indeed at 3½ to 4 inches, formation and placement are excellent, foliage is large and notably healthy, and stature eminently manageable, with most of the plants flowering at 4 feet to 4 feet 6 inches in the open. That excellent judge, MR. G. T. CAIRNCROSS—at present secretary to The Delphinium Society—has recently returned from a visit to Codsall, where he was deeply impressed with the possibilities of this strain.

There is as yet no sign of blue in it. Had FRANK BISHOP lived, he would now be faced over again with exactly the same objective—to wit, the breeding of blue into a new strain. Whilst it is known that no new infusions of American blood were used by the breeder in producing Commonwealth, the colours really speak for themselves. It is, I think, a fair assumption that they are a throw-back to the Giant Pacifics used earlier, but they are clearly none the worse for that!

Additionally FRANK BISHOP claimed that this strain is mildew-free. When a man has flowered many thousands in September from January sowings, as he did, this really means something.

THE DELPHINIUM'S POTENTIAL FROM SEED

Having shown how these modern strains build into such a desirable whole for the keen gardener, we must now turn to the factor which is most important of all to the gardening community—namely, seed.

We have observed how closely these various strains are related, yet how utterly different are the resultant plants. We are dealing, of course, solely with hybrids—mongrels, if you like—and that is the reason. There is no steadying influence of the species as in the breeding of rhododendrons. All are mongrels, and even the Giant Pacifics, if seed is saved year after year from selfed plants, will break up into different colours. They cannot remain fixed in the succeeding generations unless in expert hands.

But the important thing really is that the generally successful work of the breeders on the plants has immediate effect upon the seed, thus making the task of raising from seed ever more fascinating. Certainly it is much more profitable to raise plants from refrigerated seed of these strains than it is to invest in obsolete named plants. In this connection it should be remembered that even the novelties of 1957 have taken at least five, and sometimes seven years to reach the public, whereas the annual improvement in seed is available to the public within a twelvemonth.

As an instance of the wonderful variety and quality obtainable from

a packet of seed I would mention that when I was privileged to lecture at Vincent Square last July I was able to project detailed close-up pictures of no less than eight completely desirable plants, all utterly different in colour-effect, yet all emanating from one packet of Bishop seed from which sixty plants were raised! During these last four summers, at my own garden, when opened in aid of the National Gardens Scheme, this very factor has been of supreme interest to some four thousand visitors.

POLLINATION AND THE BEES

From the publications of The Delphinium Society it is possible to quote both DR. BRIAN LANGDON and FRANK BISHOP to support the belief that the bumble-bee, though frequently visiting the delphinium, hardly ever succeeds in effecting pollination. When I asked FRANK REINELT for his views on this point, he stated categorically that no insects interfere with the delphinium in this way, and he plants his block of 100,000 plants with each of the different colours right alongside each other quite fearlessly and without detriment. This point about the bees is quite unassailable; several breeders have emasculated florets to find that no seed matures, thus proving the point beyond reasonable doubt.

Whilst reminding you that quite a large proportion of the best of named varieties have come from self-fertilized seed and not from man-made crosses, the real importance of this business about the bees lies in the fact that if seed is saved from a fine named variety, self-fertilized, the resultant seedlings will in fact be the next generation of the cross which produced the named variety. Variations in these seedlings may well be very great, but, speaking generally, some good things should naturally turn up.

In my view, it is this very quality and element of surprise in seedlings which is inducing so many newcomers to grow delphiniums, but the proper course is to enjoy the best of both worlds. So let us deal with plants first and then the seed.

THE CULTIVATION OF PLANTS

The planting season. If you really are prepared to look after new plants, then the thing to do is to purchase rooted cuttings ex pots in May and June. This is the most successful method of all and is almost certain to give very fine spikes the following season, but only if you make a real job of the cultivation and are ready to be ruthless in denying yourself any bloom. It is the nipping out of the buds as they form which promotes a large crown and root system. As an alternative, you may plant mature plants in autumn on light soils and in spring on heavy land.

Soil preparation. Whilst the delphinium is a plant which never refuses to flower, however much transplanted, it never gives of its best in the season immediately afterwards. It pays to decide on its home once and for all and to do your best to ensure that the soil for two spits is made as much like a sponge as possible—that is, to incorporate as

much as 50 per cent humus so that the winter and spring rains get stored up in the soil. Then in the growing season the roots can go on seeking moisture continually, thus stretching out the spikes to give them their full beauty.

Thinning. Never have more than five stems on any plant, and less if it is not such a vigorous variety. By the time the plant is a foot high, this thinning should have been carried out and you will be rewarded with fine representative spikes, and at the same time comforted by the knowledge that you are promoting a good crown-forming habit in the plant and increasing its life by preserving a proper balance between bloom and roots. *Thinning, like pruning, is the most important single operation of all.*

We have just seen one of the hottest June-July seasons for many years. Temperatures soared to 90° and rain was scarce at the material time, yet plants in good ground, well thinned, gave splendid results, and especially so for those who kept the hoe going to reduce the top inch to a fine tilth, thus preventing the capillary action by which the soil moisture is drawn off by the sun.

Staking and tying. The effectiveness of this is greatly helped by the thinning, which lets the sun and air in to harden the stems properly. Anchor your stems early with a cane and a loose tie on each, and follow up later on with a second tie, *taking care that this is on hard wood only*. The length of your canes is a matter for personal preference; I keep mine down below the foliage and allow movement of spike and cane in the wind, but some prefer to tie right up through the blossom. I feel this gives too much resistance to wind and rain, thus causing more damage.

Feeding. Beware of too much nitrogen as it causes lush growth and soft stems. Some potash on light soils is necessary for colour, and phosphates are very helpful on all soils in hardening the stems.

Pests and diseases. With all the greenfly, blackfly and blight we have seen this season we can congratulate ourselves that our plant is quite immune from all. The only enemy to be really faced is the slug, the proper control for which has already been mentioned.

Frost damage in spring, and fasciation, can both be ignored as seasonal and not permanently damaging to the plant. The boring into the young spikes in late April and May by the larvae of the tortricid moths is best dealt with by keeping the eyes wide open for leaf-curling and killing off the larva inside the young leaf before it has done its damage. Virus in any plant, as revealed by the mosaic of yellow on the leaf and its elongation, can only be combated by digging up and burning the plant in question.

Black rot is a trouble to many and can cause heavy plant losses. Good cultivation, good drainage and sensible feeding *to harden the crowns*, avoiding excess of nitrogen, help a great deal, but in my opinion the biggest source of this trouble is in the stagnant water inside the old stems through the winter. When cutting down in late autumn it is best

Photo, Arthur Hunt

THE MODERN DELPHINIUM

FIG. 109—A corner in the garden of the late FRANK BISHOP, breeder of delphiniums. Reproduced by kind permission of the Delphinium Society

Photo, Amateur Gardening

GARDENING ON CHALK

FIG. 110—The chalk pit in the garden at Highdown

Photo, Amateur Gardening

GARDENING ON CHALK

FIG. 111—*Eremurus elwesii* with Paeony 'Defender' at Highdown

(See p. 374)

Photo, Arthur Hunt

THE MODERN DELPHINIUM

FIG. 112—Delphinium 'Dora Cairncross', a fine variety raised by G. T. CAIRNCROSS, ESQ., O.B.E. Reproduced by kind permission of the Delphinium Society

FIG. 113—*Sorbus megalocarpa* with daffodils in spring at Highdown

Photos, Amateur Gardening

GARDENING ON CHALK

FIG. 114—Daffodils and cherries in spring at Highdown

Photo, Amateur Gardening

GARDENING ON CHALK

FIG. 115—Part of the rock garden at Highdown

Photo, Donald F. Merrett

FIG. 116—*Tulipa saxatilis* in spring at Highdown (See p. 373)

OPPOSITE:

FIG. 117—*Top left:* Plant in third year showing suitable material for taking cuttings 3½–4 inches in length. *Top right:* The last of 19 good cuttings which have been taken off the plant in the previous photograph. Note the angle of the cut allowing for the base of the shoot curving inwards towards the crown. The foliage should not be trimmed. *Centre left:* The same plant three weeks later showing further cuttings which may be taken. *Centre right:* Cutting covered by jam jar. Some shading from hot sun may be necessary and the jar should be wiped for condensation at intervals. *Bottom left:* Two well-rooted cuttings with vermiculite clinging to the roots. These are suitable for potting up in order to harden them before planting out. *Bottom right:* A pan with 30 cuttings in it entering the fourth week (See p. 388).

Photos, Arthur Hunt *Reproduced by kind permission of the Delphinium Society*

THE MODERN DELPHINIUM

PROPAGATION BY CUTTINGS

cuttings in it entering the fourth week (See p. 388).

Photos, J. E. Downward

FIG. 118—The George Robert White Medal of Honor awarded to the Royal Horticultural Society in 1956 by the Massachusetts Horticultural Society (See p. 366)

Photo, Arthur Hunt

THE MODERN DELPHINIUM

FIG. 119—Delphinium 'Daily Express'. A fine variety raised by MR. RONALD PARRETT. Reproduced by kind permission of the Delphinium Society

Photo, J. E. Dowmeard

TWO UNUSUAL PLANTS

FIG. 120—*Utricularia alpina*. Plant shown at the Chelsea Show by the Royal Botanic Gardens, Kew. An Award of Merit was given to this plant and a Certificate of Cultural Commendation was awarded to the Curator

(See pp. 392 and 408)

FIG. 120—*Utricularia alpina*. Plant shown at the Chelsea Show by the Royal Botanic Gardens, Kew. An Award of Merit was given to this plant and a Certificate of Cultural Commendation was awarded to the Curator (See pp. 392 and 408)

Photo, J. E. Downward

TWO UNUSUAL PLANTS

FIG. 121—*Dorstenia bornimiana*. Plant shown at the Chelsea Show by the Royal Botanic Gardens, Kew, for which a Certificate of Cultural Commendation was awarded to the Curator (See p. 392)

Photo, J. E. Downward

FIG. 122—Part of the Rock Garden at the Chelsea Show constructed by the staff of the Royal Horticultural Society's Gardens at Wisley (See pp. 389–91)

to do so *at ground level*; some keen gardeners of my acquaintance seal up the hollow stems with plasticine—undoubtedly very effective but rather too much trouble.

THE RAISING OF SEEDLINGS

From good seed this can provide many a thrill and no one should miss this experience. Have your named plants by all means—they are of proved constitution after all and thoroughly reliable—but it is in the seedlings that the new breaks turn up; all are different, and watching them come into flower has a fascination all its own. By selecting the best, and ruthlessly discarding the inferior plants, anyone can raise a first-class collection; it is not only a source of great pleasure to the raiser, but also very economical.

Now there is nothing complicated about this raising of delphinium seedlings. Indeed, it is a very simple matter, but there are three definite times of year to choose from.

Late summer–early autumn. In this case we are dealing with freshly harvested seed and no refrigeration is necessary. I have found this method very successful when the seedlings are pricked out into a bed in a cold frame and, by the judicious use of the light, are kept growing on as late into the year as possible. The frame must be treated for slug spawn in the manner described and the plants must be cared for and watched after dying down, for growth will recommence earlier than in the open. From a September sowing, planted out from the frame in March, representative spikes will be enjoyed throughout July, a matter of eleven months.

January sowing. In a greenhouse with enough heat to ensure 45° at night, a January sowing can be very successful, giving open-ground representative bloom in September—in all, a nine-month job.

March sowing. This is the normal. Only in an exceptional summer will it give proper spikes the same season. More usually one has to wait fifteen months, until June of the following season.

The method of sowing. Ordinary seedboxes in a ventilated frame or greenhouse are thoroughly satisfactory and a sterilized seedling compost is best. By all means incorporate vermiculite for steady moisture content, and fine bone-meal for promotion of fibre in the roots. The seed itself is about a sixteenth of an inch long and can be covered up to a quarter inch. Have the compost thoroughly moist beforehand and water the seed in well, once, through a fine rose. After that devote all your efforts to achieving germination without the need for further water—that is, cover the box and germinate in the dark, without applying heat which would cause drying-out. In stubborn cases I have known the boxes placed on the hot-water pipes, when everything has simply "erupted", but it is a dangerous policy, and "slow, cool and moist" is to be preferred.

After-culture. Uncover when general germination takes place. If water is needed, give it at the right temperature and by immersion.

Gardens at Wisley (See pp. 389–91)

Keep shaded from the sun and, when large enough to handle, pot the seedlings up singly in 3-inch pots, growing them on in a ventilated cold frame or on the staging. Watering will now be a daily operation. Choose dull weather for planting out into the open so as to let the plants get away to a good start, but do not on any account let them get pot-bound. In amateur gardens where space is valuable, 6–8 inches between plants and 12 inches between rows is ample for the seedlings until selection of the best commences.

If you can bring yourself to do it, it pays hand over fist to pinch out the tip of the first spikelet as soon as it begins pushing upwards. This promotes rapid root movement, followed by formation of a good fat bud on the crown, from which you will obtain a very good spike. But most of us want to see what colour the plant is, in which case it is sufficient to leave a couple of florets only, nipping the others off. This impatience does however delay the main spike by quite four or five weeks.

MULTIPLYING THE FAVOURITES

Favourite named plant, perhaps expensive, or selected seedling—it makes no difference, something must be done about it! Chopping it into pieces and replanting the pieces is the least effective method, being slow and unhealthy. To sever the young shoots in spring and to root them provides the quickest and healthiest method. The cut must be made where the shoot meets the crown, the base of the cutting must be solid and healthy; set in pots or boxes in vermiculite, sharp sand, or sandy compost and, kept close for three weeks, roots form quite readily. Then pot the rooted cuttings up and grow on as with the seedlings, except that no flowering should be allowed until September (Fig. 117).

VARIETIES OTHER THAN THE ELATUM HYBRIDS

Belladonnas. Many of these are attractive and inasmuch as they usually flower twice are well worth having. No work of any moment has been done on them by the breeders, the variety 'Bonita' being the only new introduction since 1945. The plants are normally sterile of course, hence the difficulty in the way of improvement.

Before the war the big event in the belladonna world was the introduction of 'Pink Sensation'; but this hybrid from *D. nudicaule* was a very different thing at the time of introduction to what it is now. This summer MR. THEODOR RUYS told me that they had had 60,000 plants and that they were 6 feet tall. The deterioration in this plant merely reflects the weakness of *D. nudicaule*.

West of the Rockies. These are interesting plants from 1 foot to 3 feet in height and in great colour variety, including pure rose-pink, scarlet and crimson. They have been evolved by A. A. SAMUELSON of Washington from *D. nudicaule* and other Western American species. Tuberous-rooted, they are best lifted in autumn, but lend themselves very well to pot-culture. Newly introduced in Great Britain, they are not as yet in commerce.

FLOWER ARRANGEMENT AND THE ELATUM HYBRIDS

When discussing any flower nowadays it is no longer possible to ignore the decorative potential; the flower-arrangement movement flourishes exceedingly as we all know. Now in the past the delphinium has achieved the reputation of being a messy and difficult subject in the house. I feel this to be quite undeserved and probably the outcome of lack of knowledge.

The proper hardening of the bloom, by standing in deep water for some hours, the cut under water to avoid the air-lock in the fleshy rim, these precautions will give very satisfactory life to the cut delphinium, whether it be spikes, laterals or florets. In addition, there is the fact that small arrangements incorporating the use of the single florets can be very delightful and afford the flower-arranger something entirely new but practicable with which to work. For household use the florets and side branches are fine material, and for church decoration, wedding receptions and so on the main spikes can hardly be bettered.

The delphinium has, indeed, a versatility all its own, and lends itself admirably to drying for use through the winter.

I have tried to show that wherever the delphinium is loved it can and should be grown. There is no longer any valid reason for going without it, and I hope sincerely that more and more of those gardeners who have had one prejudice or another against it may now feel able to cast them aside and "go to it" with enthusiasm, confidence and success.

THE SOCIETY'S ROCK GARDEN AT THE CHELSEA FLOWER SHOW, 1957

R. A. J. Holder

(*Superintendent, the Rock Garden and Alpine Department, R.H.S. Gardens, Wisley*)

IN constructing and planting a rock garden on the rock garden bank at the Chelsea Flower Show in 1957 the Society's Gardens staff at Wisley broke new ground. It had been felt for some time that an exhibit displaying plants, most of which could be grown on an alkaline soil, would render a service to a wide number of Fellows and others visiting the Show. Judging from the innumerable appreciative remarks heard at the Show, we felt that a considerable measure of success had been achieved (Fig. 122).

Some thirty-five tons of Purbeck stone was used and the area covered was about 2,250 square feet. The background consisted of several well-grown specimens of Japanese maples with a few evergreens to act as fillers for screening purposes. The aim throughout was to avoid the use of very large rocks, and to present an arrangement which would

be within the powers of amateur enthusiasts to copy or adapt for their own purpose. The majority of the rocks used weighed between two and twelve hundredweights and only two scaled about twenty-five hundredweights. The design allowed for the maximum area being developed for planting.

The rock garden was built roughly in three sections of uneven sizes, that on the left being split by a stream with two waterfalls, terminating in a 5-foot cascade falling into a carefully designed pool. A gully with stepping-stones leading from the grass front into the woody background bent a little to the right towards the back of the garden, and separated the left-hand and middle sections. The stepping-stones were surrounded with a dense carpet of *Thymus serpyllum coccineus* in full flower.

To the right of the thyme path was the section with the largest stones, and this was separated from the extreme right wing by another gully with broken rocks leading down to a scree, the idea being that a small avalanche had swept down forming the gully and providing the smaller stones and debris for the scree.

It is worthy of note that the work of construction and planting was carried out by a small band of enthusiastic members of the Wisley staff and student-gardeners, with little or no previous experience of dealing with a show rock garden. I was privileged to have the supervision of this group. We made an early start from Wisley each morning and returned late each evening for nearly three weeks, and muscles not much in previous use soon made themselves felt.

Several thousands of plants were used, and by a system of forcing and retarding it was possible to bring together in one exhibit many plants which under natural conditions would never flower together. At flower shows this is usually regarded as permissible, and although the purist is liable to criticize the inclusion of, say, *Primula rosea* and *Geranium dalmaticum* in flower at the same time, there is an advantage in presenting as wide a selection as possible. The time-honoured cliche about "bedding out with alpines" was heard, and it is agreed that in one's own garden everything would not be in flower for about one week of the year; care would probably be taken to ensure that adjacent pockets would contain plants which would flower at different times.

It is not possible to list all the plants used. In front of the maples was a group of *Meconopsis grandis* with some plants of a red-flowered meconopsis collected by STAINTON, SYKES and WILLIAMS in Nepal in 1954. In front and to the left of these were *Verbascum dumulosum* and *Penstemon edithae*, A very bright patch of *Armeria maritima* 'Vindictive' was conspicuously placed in the centre, and near this were *Lithospermum diffusum* 'Grace Ward' and *Geranium dalmaticum*, Hanging over a rock in a prominent position was *Genista lydia*, and under this on a lower level a planting of *Veronica rupestris*. A large drift of *Rhodohypoxis baurii* and two of its varieties occupied an area at the foot of the largest rock, and these, still rather unusual, plants drew much attention.

The edelweiss *Leontopodium alpinum* was included, and above this were planted *Helianthemum* 'Watergate Ruby' and *Geum* 'Jeannie Ross'. Planted below and to the side of this arrangement was a carpeting of *Gypsophila dubia* and nearby a bold mass of the lovely golden-yellow flowered *Hypericum rhodopaeum*, *Polygonum capitatum* with its attractive combination of pink flowers and reddish foliage was used freely, but this plant would need protection in the winter. Another effective group of plants included *Helianthemum* 'Jubilee', *Linum arboreum*, *Anchusa caespitosa* and *Convolvulus cneorum*.

The scree planting included *Erodium corsicum carmineum*, an assortment of lewisias, the white-flowered form of *Geranium dalmaticum*, *Helichrysum orientale* and *Sedum pilosum*—the two latter would benefit by a covering of glass in the winter—*Globularia bellidifolia* and *G. trichosantha*, *Linum* 'Gemmel's Hybrid' and *Phyteuma comosum*.

Many very fine dwarf conifers were carefully sited and the well-grown specimens of *Juniperus communis compressa* were much admired.

The pool was planted with the water hawthorn *Aponogeton distachyus*, the water violet *Hottonia palustris*, the bog bean *Menyanthes trifoliata*, *Iris laevigata* and the variegated form of *I. pseudacorus*. On the banks around the pool were large drifts of *Primula rosea*, *P. denticulata*, *P. aurantiaca* and *P. cockburniana*. On the one side of the waterfall *Mimulus* 'Whitecroft Scarlet' was very striking, and on the opposite side *M.* 'Red Emperor' and *Caltha palustris fl. pl.* provided a bright display enhanced by their reflections in the water. *Calanthe tricarnata* and *Cypripedium pubescens* were planted between the pool and the scree, but the plant in this position which gave rise to most enquiries was *Primula viali*.

Looking back over the two years during which the plants were being prepared it seemed at times as though the weather was continuously against us. The very early growth during the spring of 1957, followed by the cold spell when plants appeared to stand still, will always be remembered.

TWO UNUSUAL PLANTS

CERTIFICATES of Cultural Commendation were awarded at the Chelsea Show to the Curator, Royal Botanic Gardens, Kew, for the very fine pair of unusual plants *Utricularia alpina* and *Dorstenia bornimiana* and an Award of Merit was also made to the *Utricularia*. The following notes on these plants and their cultivation have been sent by MR. L. STENNING, Assistant Curator, Royal Botanic Gardens, Kew.

Utricularia alpina

This free-flowering "Bladderwort" is widely distributed throughout the West Indies and tropical America. In its native habitat it grows as an

epiphyte on trees among mosses, etc. It is interesting to note that the majority of the aquatic species of *Utricularia* have small hollow bladders formed on the root system, with a small aperture; these bladders are utilized to trap minute insects as a source of food.

The bladders on *Utricularia alpina* are solid; this no doubt is a food reserve to tide this particular epiphytic species over dry periods. This plant will flourish in a compost consisting of peat, decayed leaf mould, sphagnum moss, and broken charcoal, in equal parts, in pots or pans. The receptacle should be partially plunged in large saucers of rain-water, and grown with orchids, such as cattleyas, or in an intermediate house in partial shade with a summer temperature of 65 to 70° F. and 48 to 50° F. in winter. During the winter months, the resting period, the water in the saucers should be reduced, leaving only sufficient to keep the compost moist.

Propagation is by division in spring, when the plants begin to make new growth, or by seed sown in spring in a peaty compost and partially plunged in saucers of rain-water, similar to the adult plants (Fig. 120).

Dorstenia bornimiana

This remarkable little plant is a native of tropical Africa; it was imported from Uganda in 1951 and belongs to the same family as the fig, Moraceae.

Dorstenias are widely distributed throughout the tropics. The majority of the species are erect in habit and usually grow from creeping rhizomes. This dwarf compact species has a tuberous root stock, so requires a resting period.

The flowers are very inconspicuous, yellowish green in colour, borne on a curious, succulent, leaf-like receptacle. Seeds are produced singly in a cell-like structure. When ripe they are ejected from the receptacle and often fly from 4 to 6 feet from the parent plant.

Plants will flourish in a good open compost, such as John Innes, with a little broken brick or sandstone added. Repotting should be done annually in spring when the plants begin to make new growth after the resting period. Place them in a warm, humid temperature of 65 to 70° F. during the growing season. When resting store plants on a shelf in a sunny position in a dry atmosphere, the temperature should be 60° F.

Propagation is by division, or from seeds sown in spring in sandy soil. The seedlings should be pricked off into pans and left for the first year to develop tubers (Fig. 121).

L. STENNING

THE DAFFODIL BALLOT

THE number of good daffodils in commerce being so great that all beginners and many other people must have found it difficult to make a selection, it was decided in 1936 that it would be a good thing to seek information as to the best daffodils for particular purposes by means of a ballot conducted among those who had made a study of daffodils and to publish the results each year. In pursuance of this scheme the results of ballots were published in the years 1936–40 and 1946–56 in the *Daffodil* and *Daffodil and Tulip Year Books*.

A similar ballot has been held in 1957. Twenty-five daffodil specialists have taken part, and part of the results is sumarized below. The recommendations dealing with varieties for exhibition and for market are not included here but will be found in the Year Book. Except where otherwise stated, voters were asked to take no account of the price of the bulbs. Many varieties were mentioned by only one voter, and no reference is made to such varieties in the tables. The figure in brackets after a name indicates the position of the variety in last year's ballot. Where no figure is given in brackets the variety did not appear in the 1956 summary, having obtained only one vote or no vote at all.

The results as shown by these ballots must not be taken necessarily as the recommendations of The Royal Horticultural Society.

VARIETIES FOR CUTTING

Listed in a retail catalogue at a price sufficiently low to allow of their being obtained in reasonable quantities.

Name	*Position*	*No. of votes*	*Name*	*Position*	*No. of votes*
'Carbineer' (1)	1	17	'Blarney' (15)	15	5
'Fortune' (2)	2	16	'Cromarty' (19)	15	5
'Rustom Pasha' (4)	3	14	'Adamant' (22)	17	4
'Flamenco' (5)	4	13	'Greeting' (17)	17	4
'Polindra' (2)	4	13	'Geranium' (27)	19	3
'Brunswick' (7)	6	12	'Limerick' (19)	19	3
'Kilworth' (11)	6	12	'Mahmoud' (19)	19	3
'Carlton' (7)	8	11	'Principal' (12)	19	3
'Actaea' (12)	9	10	'Royal Mail' (22)	19	3
'Beersheba' (12)	9	10	'Bahram' (22)	24	2
'Havelock' (7)	11	9	'Bodilly' (27)	24	2
'Dunkeld' (5)	12	8	'Golden Harvest' (27)	24	2
'King Alfred' (7)	12	8	'Penvose' (22)	24	2
'Trevithian' (15)	12	8			

'Carbineer' continues to occupy first place as the best variety for cutting although it received one vote less than last year. 'Fortune' maintains its position as second favourite, but 'Polindra' has dropped back further and third place is now held by 'Rustom Pasha'. 'Flamenco'

and 'Brunswick' each rise one place in the table, while 'Kilworth' continues its good progress and jumps five places. 'Actaea' and 'Beersheba' have improved their positions. 'Dunkeld' has lost favour with a drop from fifth to twelfth position, and 'Havelock' has also gone back four places. 'King Alfred' has lost further ground, but 'Trevithian', 'Cromarty', 'Adamant' and 'Geranium' have moved up. The positions of 'Blarney', 'Greeting', 'Limerick' and 'Mahmoud' remain unchanged. 'Principal' has lost seven places. 'Ludlow', 'Killigrew', 'Foresight', 'Folly' and 'Porthilly' have gone.

VARIETIES FOR POTS, PANS OR BOWLS

Listed in a retail catalogue at a price sufficiently low to allow of their being obtained in reasonable quantities.

Name	*Position*	*No. of votes*	*Name*	*Position*	*No. of votes*
'Beersheba' (1)	1	18	'La Riante' (14)	16	4
'Cragford' (1)	2	16	'Mahmoud' (18)	16	4
'Silver Chimes' (1)	3	15	'Niphetos' (16)	16	4
'Cromarty' (4)	4	14	'Rippling Waters' (19)	16	4
'Dunkeld' (6)	4	14	'Golden Torch'	20	3
'Carbineer' (5)	6	13	'St. Agnes' (22)	20	3
'Carlton' (8)	6	13	'Trousseau' (22)	20	3
'Geranium' (12)	8	10	'Ardclinis'	23	2
'Polindra' (10)	8	10	'Edward Preston'	23	2
'Rustom Pasha' (9)	8	10	'Fortune'	23	2
'Trevithian' (6)	8	10	'Kilworth'	23	2
'Foresight' (12)	11	8	'Porthilly' (22)	23	2
'Havelock' (10)	11	8	'Rembrandt' (19)	23	2
'Brunswick' (14)	13	7	'Royalist' (22)	23	2
'Golden Harvest' (16)	13	7	'Tresamble'	23	2
'Sincerity' (19)	15	5			

'Beersheba' has now established a clear lead in this section, while its close competitors of the past four years, 'Cragford' and 'Silver Chimes', have slightly lost favour. 'Carbineer' is still moving back and 'Geranium' has jumped four places. 'Carlton', 'Polindra', 'Rustom Pasha', 'Golden Harvest', 'Sincerity' and 'La Riante' have moved up, but 'Trevithian' and 'Havelock' have lost ground. 'Tresamble' has reappeared and 'Golden Torch', 'Ardclinis', 'Edward Preston', 'Fortune' and 'Kilworth' have been added to the list. 'Cheerfulness' has been eliminated.

VARIETIES FOR GARDEN DECORATION

Listed in a retail catalogue at a price sufficiently low to allow of their being obtained in reasonable quantities.

Name	*Position*	*No. of votes*	*Name*	*Position*	*No. of votes*
'Rustom Pasha' (2)	1	17	'Brunswick' (3)	3	14
'Kilworth' (7)	2	16	'Carbineer' (1)	3	14

Name	*Position*	*No. of votes*	*Name*	*Position*	*No. of votes*
'Cromarty' (3)	5	13	'Goldcourt' (28)	18	5
'Flamenco' (3)	5	13	'Stadium' (18)	18	5
'Fortune' (10)	7	10	'King Alfred' (18)	22	4
'Polindra' (3)	7	10	'Principal' (18)	22	4
'Beersheba' (8)	9	9	'Scapa' (22)	22	4
'Carlton' (8)	10	8	'Niphetos' (22)	25	3
'Golden Harvest' (14)	11	7	'Penvose' (28)	25	3
'Adamant' (13)	12	6	'Silver Bugle' (22)	25	3
'Dunkeld' (14)	12	6	'Actaea' (28)	28	2
'Havelock' (12)	12	6	'Alight' (22)	28	2
'Limerick' (14)	12	6	'Bodilly' (28)	28	2
'Mount Hood' (18)	12	6	'Effective' (22)	28	2
'Trevithian' (10)	12	6	'Godolphin' (28)	28	2
'Fermoy' (28)	18	5	'Mitylene' (28)	28	2
'Foresight' (14)	18	5			

'Carbineer' has dropped to third place from the head of the table and 'Rustom Pasha' is restored to the position it held two years ago. 'Kilworth' has continued its rapid progress and now occupies second place with a jump of five places. 'Brunswick' remains as last year, but 'Cromarty', 'Flamenco' and 'Polindra' are moving back. 'Golden Harvest' and 'Mount Hood' continue to improve their positions, while 'Fermoy' and 'Goldcourt' are also becoming more popular. 'Trevithian', 'Foresight', 'King Alfred', 'Principal', 'Alight' and 'Effective' have all moved down the table. 'Porthilly' and 'Folly' have failed to secure two votes this year.

VIRUS DISEASES IN THE NARCISSUS TRIAL AT WISLEY

L. Broadbent

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D. E. Green and J. B. Paton

(The Royal Horticultural Society's Gardens, Wisley, Surrey)

PLANTS in the Narcissus Trial at Wisley had been infected with viruses for many years, but removing (roguing) the worst-infected plants during the spring had kept in check the most serious disease, variously called "Narcissus mosaic", "yellow stripe" or "grey disease". The plots were not rogued in 1951, and by the spring of 1952 the stripe disease was so prevalent as to render the trial virtually useless.

During the last six years we have attempted to rid the trial of the stripe virus and to prevent its spread to uninfected plants. VAN

SLOGTEREN and OUBOTER (1941) recognized the following symptoms, caused by three viruses:

1. Yellow stripe—an irregular discolouration of the foliage and flower stems, showing as longitudinal yellow, light green or grey stripes of various lengths and widths.
2. Mosaic—a light or dark green severe mottling of the whole leaf surface.
3. Silver leaf—a silvering of the whole leaf surface by white, broken thin streaks.

Vague mottles have been seen at Wisley that do not fit any of these descriptions. Experience suggests that these symptoms are caused by the stripe virus in some varieties, but as they also occur in varieties in which stripe shows clearly, there is probably more than one cause. Roguing all the plants that were faintly mottled would have meant removing most of the plants in the trial, so only those showing definite symptoms were removed. These were mostly plants with stripe; mosaic and silver leaf were rare.

BLANTON and HAASIS (1940) and VAN SLOGTEREN and OUBOTER (1941) transmitted narcissus viruses experimentally by aphids. As narcissi are not usually colonized by aphids during their normal period of growth, any transmission in the field must be by aphids that visit infected plants and then healthy ones during flight. Such transient aphids have been seen on narcissi during May and June. The weather is too cold for aphid flight before late March, and in most years few fly before late April.

The narcissus stocks in the trial at Wisley remain there for three years, although some used as standard varieties remain for many years. Each stock is represented by twenty-five single-nosed round bulbs which, before planting, are given the warm-water treatment to control eelworm and narcissus fly. Until 1952 the bulbs were planted in blocks 2 feet square, containing five rows of bulbs, and the blocks were separated by 18 inches of cultivated soil. The trial ground was surrounded by a hornbeam hedge 8 feet high. Some new stocks were planted in the trial every year to replace those discarded.

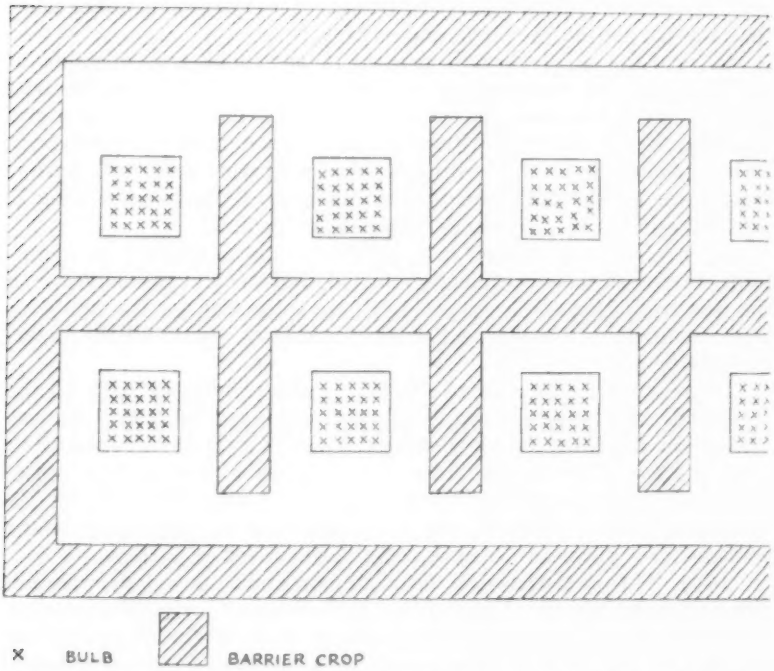
In 1952, 486 (17 per cent) severely infected plants were removed from the 119 stocks. Infected narcissi were numerous in other parts of the Gardens, particularly in Seven Acres, but it was doubtful if virus would often spread from there to the Floral trial grounds, because a dense woodland intervenes. The Curator's private narcissus stocks, about 100 yards from the trial, were uninfected, which suggested that long-distance spread had not occurred. Spread was obviously occurring mainly from infected to healthy plants within the trial.

Three methods of limiting the spread of virus at Wisley were considered possible:

1. Removing all plants showing definite symptoms. (Roguing.)
2. Separating the plots from each other by plant barriers thought not to be susceptible to narcissus viruses.

3. Spraying the plants with a systemic insecticide every three weeks from April until they died down.

Roguing was expected to be the most successful measure, because the obviously infected plants could be removed during March and early April before aphids were active. It was probable, however, that some varieties were symptomless carriers of the virus in most seasons, so roguing alone was not likely to be entirely successful Mosaic and silver leaf do not show until late May or early June, so the plants had to be inspected at intervals throughout their growth.



TEXT FIG. 1—*Method of interplanting trial stocks with a barrier crop of rye* (see p. 398).

Narrow barriers of barley and other plants effectively decrease the incidence of virus diseases in cauliflower seed beds. Many aphids alight on the barrier plants and fly off again without visiting the seedlings, and some probably lose the capacity to transmit non-persistent viruses while feeding on the barrier plants.

Systemic insecticides do not kill aphids quickly, and if the narcissus viruses are picked up and transmitted by aphids in a few minutes, these sprays would not prevent virus spread; however, they were applied in the first season in the hope that they might have some effect.

Experiments at Rothamsted showed that they have none, and the trial has not been sprayed since 1953.

To put these methods into practice, the site on the Floral trial grounds was gradually abandoned and each stock was removed as it completed its three years in the trial. A new site was chosen on the Vegetable trial grounds in the autumn of 1952, where the open conditions more nearly resembled those likely to exist on the land of a commercial grower of narcissi. This site also allowed room to grow the barrier plants round each plot. The method of planting is illustrated in text Fig. 1: an 18-inch-wide barrier of rye (*Secale cereale*) surrounded each stock (twenty-five bulbs) of narcissi. The rye was as tall or taller than the narcissi by the beginning of May.

In 1953 the old stocks still growing on the Floral trial grounds, in addition to those replanted or newly received on the Vegetable trial grounds, were inspected on ten occasions between mid-February and mid-March and all plants with stripe or severe mottles were removed. In later years only plants showing definite stripe were removed. A summary of the numbers of plants rogued during 1952–7 is given in Table I, the total number and percentage each year in Table II.

1953. In the old Floral trial, seventeen stocks showed no symptoms, seventeen were completely infected, and the rest partially so. In the new trial, four of the seventeen stocks submitted for the first time were completely infected, and in only five stocks were all the plants symptomless.

1954. All the plants in two of the stocks planted in 1952 on the Vegetable trial grounds, which were symptomless in 1953, showed symptoms; of the old stocks brought from the Floral trial grounds four complete stocks had to be removed and all the plants in three out of nineteen new stocks received the previous year (1953) were infected. In the partially-infected stocks, 135 plants inspected the previous year and seventy-three plants of the new stocks now showed symptoms.

1955. The beneficial effect of the measures taken during the previous two years was evident. None of the stocks rogued during the previous years was eliminated, but all the bulbs in three of the thirty-six new stocks were infected and were removed. One plant only was removed from the seventeen stocks from the 1952 planting, twenty-five from the sixty-seven stocks planted in 1953, eleven from the five Wisley stocks planted in 1954, and fifty-one from the ten partially-infected new stocks.

1956. The weather was cold and dry during the spring, conditions which appeared to be good for symptom expression, because eight stocks which had been passed in previous years were removed as being completely infected. However, only sixteen plants were removed from the sixty other stocks planted in 1953, twenty-three from the thirty-seven planted in 1954, and none from the nine Wisley stocks planted in 1955; twenty-one infected plants were removed from the three new stocks.

1957. The Narcissus and Tulip Committee wished to have the trial in the Floral trial grounds again, so the eighty-six remaining stocks

TABLE I

Plants showing stripe symptoms and removed during six years

Year of roguing		Floral Trial Grounds	Vegetable Trial Grounds								1956 planting	
			1952 planting		1953 planting		1954 planting		1955 planting			
			Source of supply		Source of supply		Source of supply		Source of supply		Floral Trial Grounds	Vegetable Trial Grounds
			Wisley	Outside	Wisley	Outside	Wisley	Outside	Wisley	Outside		
1952	Number of stocks rogued	119										
	Number of bulbs destroyed	486 16·9%										
1953	Number of stocks rogued	119	6	17								
	Number of complete stocks removed	17 } 21·4%	0	4 } 28·0%								
	Number of bulbs removed from remainder	262 }	11 7·3%	19 }								
	Number of symptomless stocks	17	2	3								
1954	Number of stocks rogued	5	6	13	55	19						
	Number of complete stocks removed	0	1 } 23·8%	1 } 12·8%	4 } 14·8%	3 } 31·2%						
	Number of bulbs removed from remainder	9 8·2%	8 }	15 }	103 }	73 }						
	Number of symptomless stocks	0	0	1	22	6						
1955	Number of stocks rogued		5	12	51	16	5	36				
	Number of complete stocks removed		0	0	0	0	0	3 } 14·0%				
	Number of bulbs removed from remainder		1 0·9%	0 0%	24 2·1%	14 4·3%	11 8·8%	51 }				
	Number of symptomless stocks		0	1	21	4	2	23				
1956	Number of stocks rogued				51	16	5	33	9	3		
	Number of complete stocks removed				5 }	2 }	1 }	0	0	0		
	Number of bulbs removed from remainder				10 } 10·8%	6 } 15·9%	0 21·0%	13 1·3%	0 0%	21 28·0%		
	Number of symptomless stocks				16	3	1	16	9	2		
1957	Number of stocks rogued										86	20
	Number of complete stocks removed										4 } 5·4%	1 } 6·4%
	Number of bulbs removed from remainder										17 }	7 }
	Number of symptomless stocks										27	15

were moved in the autumn of 1956. They were planted in a long narrow strip, without plant barriers, adjacent to a mixed planting of shrubs, herbaceous plants and narcissi, most of which showed stripe symptoms. Once again four stocks which had been passed previously were found to be entirely infected. Three of these had been grown for two years and one since 1944, but some infected plants had been removed from this one in previous years. It was decided that new stocks should not enter the trial until they had been grown for a year on the Vegetable trial grounds to find if they were obviously infected. One whole stock and seven other plants among the twenty new stocks submitted showed stripe symptoms.

TABLE II

Total number and percentage of plants removed each year

	No. of stocks	No of plants removed	Total %	Percentage removed from stocks	
				rogued previously	new
1952	119	486	16·9	17·7	—
1953	142	767	21·6	20·7	28·0
1954	98	432	18·0	14·7	31·2
1955	125	163	5·6	1·9	14·0
1956	117	245	6·7	6·2	28·0
1957	106	149	5·6	5·4	6·4

It is now obvious that there are three factors affecting the incidence of disease in this type of trial:

(1) Many of the stocks sent for trial are infected before they arrive (Table II). As most growers protested that their stocks were not infected, we must conclude that at least some of them do not recognize virus diseases, and that these diseases are common among many growers' stocks. The growth of stocks for a year in quarantine before transfer to the main trial should enable those most seriously infected to be eliminated, and thus decrease the proportion of infected new stocks entering the trial. It may comfort British growers to know that as high a proportion of new stocks submitted by Dutch growers as by British was infected.

(2) Experiments at Rothamsted and elsewhere have shown that the stripe virus spreads slowly, and mainly to nearby plants. The twenty-five plants of a stock would not become infected in one season, and the frequency with which whole stocks have shown symptoms one year, but not in previous years, suggests that symptoms may be masked in some varieties, in some conditions, but not in others. Until there is some

method of testing for viruses other than visual inspection, such infected stocks will be a constant source of danger both at Wisley and in commerce.

(3) Early roguing and the use of barrier plants undoubtedly limited the spread of virus from infected to nearby healthy plants, but the barriers took up much space and the rye grew poorly in the third year. The Narcissus and Tulip Committee preferred a compact planting for the trial, which made judging easier, and also wished that the trial should again take its place as one of the decorative features of the Gardens. It is difficult to satisfy these wishes and also keep the stocks healthy, and with the new layout there will again be spread of virus both into and within the trial. It is intended to insure against this contingency as far as possible by keeping the trial in the vegetable grounds as a quarantine or testing place for the stocks. This can then be used as source of apparently uninfected bulbs for the decorative trial in the Gardens proper.

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NOTES FROM FELLOWS

The Elimination of Ground-elder

GROUND-ELDER, or Gout Weed (*Aegopodium podagraria*), is one of the most pestilential perennial weeds that can invade a garden. This is due to its method of increasing its growth by means of underground runners. These develop root nodules at 2 to 3 inches apart. From these nodules, at places where the runner is near the surface of the ground, leaf buds form, and in due course, when the root is mature, a flower stem will also form. In June, the not unpleasing umbelliferous heads of white flowers, like cow-parsley, open out, and in due course, seeds will form.

The first leaves begin to show in early spring, and growth is rapid until the ground is covered with a dense mat of foliage. As this is not unattractive in woodland, many owners ignore it, usually with disastrous results. The weed invades elsewhere, and once established, its elimination is no light task. The suckers weave themselves in the root systems of perennials, shrubs and trees, and come up in the interstices of rock gardens and crazy paving, and in lawns.

Digging-out is the most effective method, but this takes time. There is now on the market one of the selective weed-killers which is of considerable use, especially where there are large areas to be dealt with. Digging-out can be done incorrectly. The use of a spade or other sharp-cutting implement should be avoided, as these cut the roots into small

segments, each of which will form a new plant. The fork should have prongs at least 12 inches long for old-established weed. The method is to go over about a square yard at a time, loosening the soil only, then using the fork again, lift up as much of the roots system as possible, and sift out. In this way quite a large bunch can be grasped by the right hand and pulled away. Often 2 or 3 feet of root-runner will lift up in light soils. However carefully the work is done, in a few weeks, leaves will appear again, and it will be necessary to go over the ground a second time. This second cleaning should not be left too long so that the ground settles again. It must be remembered that plucking the leaves does nothing to kill the plant, although it may retard its growth, the root system must always be removed, and burnt. Any further growth can either be dug out or given a spray of weed-killer.

It does not seem possible to clean perfectly any given area in one year. Bits of root lie dormant until the following spring, and sprout gaily. Perennial herbaceous plants had better be lifted in a mass in the autumn and planted in another plot. Then when the first sprouts of ground-elder show in the spring, these can be forked out and the ground should be practically free of this weed. The garden plants must, however, be completely freed from the weed roots, either by pulling the plant apart where this can be done, or by soaking in water to get rid of all soil to trace the weed root more effectively, before they are returned to the border. In the case of shrubs, near the stems, a hand fork should be used, and here an application of selective weed-killer, carefully applied, can be useful.

The selective weed-killer that is effective against ground-elder is marketed as S.B.K., or Brushwood killer. It is mixed to a solution of 6·4 drams to a gallon of water—approximately two dessert-spoons of S.B.K. It is best applied by a good spray syringe such as used for roses. The nozzle must be held fairly close to the leaves to avoid spray drift, which is harmful to nearly all other plants. This means that the work should be carried out only when the air is very still, and this often means early morning rising! Sooner or later some of the spray will get on some choice plant by accident, and for this purpose it is as well to keep at hand a canful of fresh water, and drench the plant *immediately*, as the weed-killer enters the pores of the leaves. The woody barks of trees and shrubs do not seem to be affected by a slight drift of spray, but sappy growths are most susceptible, and it is best not to go anywhere in the vicinity of tomatoes, dahlias or melons. In many cases it is simplest to pluck off immediately any sprayed leaves.

Ground-elder seems to be most quickly affected by this S.B.K. treatment during dry weather. In a week or ten days, the leaves should begin to wilt, and then a second application ought to be applied. Do not allow it to recover its vitality. A third application should be given in due course, and if the ground is not wanted for six weeks, a tablespoonful of sodium chlorate in the mixture helps to burn-up the leaves. It is useless to try and lessen the applications by doubling the strength of the S.B.K.

solution; this only has the effect of scorching the foliage without affecting the whole system. If some of the solution is set aside and used in a small polythene bottle sprayer, this is useful in dealing with cases where there is growth among other plants, and one leaf at a time has to be dealt with. In June, all flower stems should be either plucked low down, or cut with a sickle. Seed germination is said to be poor, but it takes place none the less. In fact, if the whole lot is cut down, and the second crop of leaves, which quickly cover the ground, are sprayed, the effect seems to be more marked. After the third application, all withering leaves should be cut after a week. This remarkable weed has tremendous powers of resistance, and a shower of rain is like brandy to a stricken man! Every further appearance of weed should be treated.

As to the economics of elimination. It is better where digging is concerned to employ several men at once, and spend a large sum on wages in a lump, rather than spread it out over a year. Such labour can often still be obtained by advertising in local papers, for work in men's spare time. Otherwise, by doing the job piece-meal—whilst one area is being cleared, another is being invaded. It spreads with great rapidity.

Never let any of the roots of this weed get on the compost-heap; it doesn't decompose, but invades the compost heap as well. All articles used for the spraying should be used for this purpose only and kept apart. Grass is unaffected by the spray. The syringe should not spray too finely and cold water is essential.

R. G. MERVYN

Godalming, Surrey.

Bamboos

I have been interested to receive two letters concerning my article on bamboos published in the June issue of the JOURNAL. MR. C. E. HUBBARD of Kew has kindly added to the records of the flowering of the species; he has received specimens in flower of *Arundinaria fastuosa* and *A. anceps* from DR. H. GILBERT-CARTER'S garden at Teignmouth. He adds that the former is also flowering at Kew and at Smith's Caledonia nursery in Guernsey; I have also seen it in flower at Exbury. *A. anceps*, he adds, has only been recorded in flower previously from a Bristol garden in 1911.

MR. F. T. NETTLEINGHAME, of the British Bamboo Groves Ltd., Lanivet, Bodmin, Cornwall, has sent several observations. He has found it quite effective to transplant bamboos all the year round. He takes me to task for speaking of *Sasa palmata*, which he would not trust at all in a garden and preferably not in an estate as it is so rampant, but feels that I should have included *Pleioblastus simoni*. It is good to hear that he finds *Phyllostachys bambusoides castilloni* as hardy as *Arundinaria fastuosa*.

I feel that these further interesting details may prove a useful addition to my original notes.

G. S. THOMAS

PLANTS AND PROBLEMS—XXXVII

DELPHINIUMS

Question. Is it possible for delphiniums to suffer from virus disease, and, if so, what are the signs?

Answer. Delphiniums may suffer from at least two virus diseases, but the common one is called Mosaic and is due to infection by Cucumis virus 1. The symptoms appear as pale veins and mottling of the leaves in light and dark green patches. The flowers often show breaking, i.e. the petals show whitish streaks or splashes. Sometimes the affected plant is stunted and obviously not normal. It may be difficult at times to be sure that virus is present, but where it is definite the affected plant should be destroyed. Only definitely healthy plants should be used for propagation.

PLANTING RASPBERRIES

Question. My old row of raspberries have lost vigour and I have decided to dispense with them. Being cramped for space, I would like to use the same piece of ground for the new canes this autumn. Is this advisable?

Answer. It is most unlikely that the new canes would ever thrive if planted where the old row grew. For preference a piece of well-cultivated ground should be chosen for the new bed, such as at one end of the vegetable plot. This sort of soil with a liberal dressing of rotted manure dug in before planting will give excellent results. Failing this, rest the old bed for at least eighteen months and preferably two years. A good plan is to grow potatoes on it, using plenty of manure; alternatively, it can be sown down in spring or summer with mustard, rape or lupin as a green crop, digging this in just as flowering commences. This is particularly advisable on lighter soils, and, with ample manure added, the ground should again grow raspberries successfully.

STRAWBERRIES

Question. Can you recommend three strawberries to give a reasonable succession of crop?

Answer. Three varieties that can be recommended are 'Cambridge Favourite' (early), 'Royal Sovereign' (second early–mid-season) and 'Talisman' (late mid-season). Both 'Cambridge Favourite' and 'Talisman' are good croppers but they do not equal 'Royal Sovereign' for flavour. All are obtainable as certified stock.

WISLEY TRIALS, 1957

DELPHINIUMS

The trial of delphiniums was inspected by the Joint Delphinium Committee of The Royal Horticultural Society and The Delphinium Society on June 21, 1957, and on its recommendation The Royal Horticultural Society and The Delphinium Society have made the following awards to delphiniums as varieties for garden decoration.

The number in brackets after the description of the variety was that under which it was grown in the trial.

BLACKMORE'S GLORIOUS. (Raised, introduced and sent by Messrs. Blackmore & Langdon, Twerton Hill Nursery, Bath, Somerset.) **F.C.C.** June 21, 1957. An elatum variety. Plant 6½–7 feet tall; flower spike 2½ feet long, 6½ inches diameter at base, tapering, flowers closely spaced, many side spikes; flower 3½ inches diameter, semi-double on long stalk; outer sepals Butterfly Blue (H.C.C. 645/2) broadly edged Cobalt Violet (H.C.C. 634/2); inner sepals Cobalt Violet (H.C.C. between 634/2 and 634/3) with silvery sheen; eye white touched with mauve (**A.M.** 1948). [26]

ARTIST. (Raised, introduced and sent by Messrs. Blackmore & Langdon.) **A.M.** June 21, 1957. Described R.H.S. JOURNAL, **81,** p. 455 (**H.C.** 1956). [40]

TYRIAN. (Raised, introduced and sent by Messrs. Blackmore & Langdon.) **A.M.** June 21, 1957. An elatum variety. Plant 6 feet tall; flower spike 2½ feet long, 5¾ inches diameter at base, blunt, flowers closely spaced, many side spikes; flower 3⅛ inches diameter semi-double, on long stalk; outer sepals Spectrum Violet (H.C.C. 735/3) touched Spectrum Blue (H.C.C. 45); inner sepals Spectrum Violet (H.C.C. 735/3); eye striped violet and white. [67]

PURPLE RUFFLES. (Raised, introduced and sent by Messrs. Blackmore & Langdon.) **A.M.** June 21, 1957. Described R.H.S. JOURNAL, **81,** p. 455 (**H.C.** 1956). [71]

TURIDDU. (Raised, introduced and sent by Messrs. Blackmore & Langdon.) **A.M.** June 21, 1957. An elatum variety. Plant 6 feet tall; flower spike 3 feet long, 6¾ inches diameter at base, slightly tapering, flowers closely spaced, many side spikes; flower 3¼ inches diameter, semi-double, on long stalk; outer sepals Violet (H.C.C. 36) touched Gentian Blue (H.C.C. 42); inner sepals Violet (H.C.C. 36); eye sepia striped violet at centre with yellow hairs. [75]

MOGUL. (Raised, introduced and sent by Messrs. Blackmore & Langdon.) **A.M.** June 21, 1957. An elatum variety. Plant 8 feet tall; flower spike 2½–2¾ feet long, 7 inches diameter at base, slightly tapering, flowers closely spaced, many side spikes; flower 3⅛ inches diameter, semi-double, on long stalk; outer sepals Amethyst Violet (H.C.C. between 35 and 35/1) tipped Gentian Blue (H.C.C. 42); inner sepals Amethyst Violet (H.C.C. between 35 and 35/1); eye white. [76]

JUDY KNIGHT. (Raised, introduced and sent by A. T. Knight, Esq., White Ness, West Clandon, Surrey.) **H.C.** June 21, 1957. An elatum variety. Plant 5 feet tall; flower spike 2¼ feet long, 6 inches diameter at base, blunt, flowers closely spaced, many side spikes; flower 3 inches diameter, semi-double on fairly long stalk; sepals a shade near Veronica Violet (H.C.C. 639/1); eye sepia with yellow hairs. [12]

DEIRDRE. (Raised, introduced and sent by Messrs. Blackmore & Langdon.) **H.C.** June 21, 1957. An elatum variety. Plant 5¾ feet tall; flower spike 2 feet long, 6 inches diameter at base, blunt, flowers closely spaced, many side spikes; flower 3–3¼ inches diameter, semi-double, on long stalk; sepals Imperial Purple (H.C.C. 33/3) deepening at margins to Imperial Purple (H.C.C. 33/1); eye white with yellow hairs. [13]

WESSEX. (Raised, introduced and sent by Messrs. Blackmore & Langdon.) **H.C.** June 21, 1957. An elatum variety. Plant 5–5½ feet tall; flower spike 2 feet long, 7½ inches diameter at base, tapering, flowers closely spaced, many side spikes; flower 3½ inches diameter, semi-double, on very long stalks; outer sepals Amethyst Violet (H.C.C. 35) tipped Gentian Blue (H.C.C. 42); inner sepals Amethyst Violet (H.C.C. 35) fading at throat to Amethyst Violet (H.C.C. 35/3); eye sepia with yellow hairs. [64]

CABBAGE LETTUCES

Fifty-six stocks of lettuces were received for trial at Wisley. The ground was prepared by digging in well-rotted farmyard manure during the winter of 1956. A base dressing was given at the rate of 3 cwt. per acre of hoof meal, 2 cwt. per acre of bone meal, and 2 cwt. per acre of sulphate of potash. The trial was sown on March 14, 1957, in drills 12 inches apart, and the plants were thinned to 12 inches apart during the second week of April.

The trial was inspected by a sub-committee of the Fruit and Vegetable Committee on June 14, 1957, and on its recommendation the Council of The Royal Horticultural Society have made the following awards to cabbage lettuces.

The number in brackets after the description of the variety was that under which it was grown in the trial.

ATTRACTION. (Raised, introduced and sent by Messrs. Co-operative Zaaizaadvereniging, West Friesland, W.A., Wijdenes, Holland.) **A.M.** June 14, 1957. Plant 5¼ inches high, 10½–11 inches across, compact; leaves light green, crumpled; heads firm, maturing evenly; fit to cut on June 12. [15]

BLONDE DE CHATELET. (Raised, introduced and sent by Messrs. L. Clause, S.A.) **A.M.** June 14, 1957. Plant 6 inches high, 11–11¼ inches across, compact; leaves light green, crumpled; heads hard, maturing evenly; fit to cut on June 8. [48]

GLORY OF NANTES. (Raised, introduced and sent by Messrs. L. Clause, S.A., Bretigny-sur-Orge, France.) **A.M.** June 14, 1957. Plant 6 inches high, 12 inches across, compact; leaves light-medium green, slightly blistered and crumpled; heads firm, maturing evenly, fit to cut on June 11. [42]

MARKET KING. (Raised, introduced and sent by Messrs. Elsoms (Spalding) Ltd., Elsom House, Spalding, Lincolnshire.) **A.M.** June 14, 1957. Plant 5½ inches high, 11 inches across, compact; leaves pale green, crumpled; heads hard, maturing evenly, fit to cut on June 14. [8]

TOZER'S COBHAM GREEN. (Raised, introduced and sent by Messrs. A. L. Tozer Ltd., Pyports, Church Street, Cobham, Surrey.) **A.M.** June 14, 1957. Plant 5¼ inches high, 11 inches across, compact; leaves medium dark green, crumpled; heads hard, maturing evenly; fit to cut on June 14. This variety is the same as that which received an **A.M.** in 1950 as 'Cobham Green' (see R.H.S. JOURNAL **76**, p. 97). [25]

ATTRACTION. (Sent by Messrs. W. Deal & Sons Ltd., Kelvedon, Essex.) **H.C.** June 14, 1957. Plant 5½ inches high, 10½ inches across, compact; leaves light green, blistered; heads firm, maturing evenly; fit to cut on June 13. [14]

GIANT BUTTERHEAD. (Introduced and sent by Messrs. Samuel Dobie & Son Ltd., 11 Grosvenor Street, Chester.) **H.C.** June 14, 1957. Plant 5½ inches high, 12 inches across, spreading; leaves light-medium green, blistered; heads firm, maturing evenly; fit to cut on June 16. [20]

MAY BEAUTY. (Raised, introduced and sent by Messrs. J. L. Clucas Ltd., Ormskirk, Lancashire.) **H.C.** June 14, 1957. Plant 5 inches high, 12–12½ inches across, fairly compact; leaves light green, crumpled; heads firm, maturing evenly; fit to cut on June 12. [26]

ALL YEAR ROUND. (Raised, introduced and sent by Messrs. A. Hansen, Kastrup, Amager, Denmark.) **H.C.** June 14, 1957. Plant 5½–6 inches high, 12 inches across, compact; leaves light-medium green, blistered; heads hard, maturing evenly; fit to cut on June 9. [34]

FELTHAM KING IMPROVED. (Raised and introduced by Messrs. Watkins & Simpson Ltd., 26–29 Drury Lane, Covent Garden, London, W.C.2; sent by Messrs. W. Deal & Sons Ltd., Kelvedon, Essex.) **H.C.** June 14, 1957. Plant 6½ inches high, 12½ inches across, compact; leaves light-medium green, blistered; heads firm, maturing evenly; fit to cut on June 13. [39]

LA CHAUME. (Raised, introduced and sent by Messrs. Vilmorin-Andrieux, S.A., 4, Quai de la Mégisserie, Paris, France.) **H.C.** June 14, 1957. Plant 5½–6 inches high, 12 inches across, compact; leaves medium green, slightly crumpled; heads firm, maturing evenly; fit to cut on June 12. [43]

WHITE BIG BOSTON. (Raised, introduced and sent by Messrs. Northrup, King & Co., Minneapolis, Minnesota, U.S.A.) **H.C.** June 14, 1957. Plant 5½ inches high, 11 inches across, compact; leaves light green, crumpled; heads hard, maturing evenly; fit to cut on June 9. [45]

LONG STANDING. (Raised, introduced and sent by Messrs. Nutting & Sons Ltd., Merstham, Nr. Redhill, Surrey.) **H.C.** June 14, 1957. Plant 6½ inches high, 11½–12 inches across, compact; leaves medium green, blistered; heads firm, maturing evenly; fit to cut on June 15. [51]

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1957

Utricularia alpina A.M. May 20, 1957. This is an epiphyte suitable for the warm greenhouse. It will flourish if grown in a basket of fibrous peat and sphagnum, suspended near the glass. It is interesting to note that this plant is closely related to our native insectivorous bladder wort *Utricularia vulgaris*. In this instance, however, the bladders are much reduced, and useless for the purpose of trapping insects. The leaves are erect, entire, elliptic-lanceolate, acute, narrowing to slender petioles, 8½ inches long and 2 inches wide. The erect scapes, which are taller than the leaves, carry from one to four flowers. The flower is

white, 1½ inches diameter, with the palate and disc of the lower lip yellow. The upper lip is 1 inch across, orbicular, horizontal, with recurved edges. The lower lip is transversely oblong, almost twice as large as the upper, with a large palate enclosing the throat of the flower. Beneath the lower lip is a stout, incurved spur (Fig. 120).

Exhibited by The Director, The Royal Botanic Gardens, Kew, Richmond, Surrey.

BOOK NOTES

"Plant Propagation." By John P. Mahlstede and Ernest S. Haber. 413 pp. Illus. (Chapman & Hall.) 60*s*.

The authors, who are Professors of Horticulture in the U.S.A., have written a book which lifts the practice and underlying science of plant propagation out of the ordinary routine work of raising plants. It is undoubtedly the result of much deep thinking and careful observation and is full of knowledge which plant propagators everywhere should possess in this modern age, although a portion of it applies mainly for use in the U.S.A. The arrangement of the book is in five main parts. The first is of a botanical nature and is concerned with the classification and structure of plants and plant growth and development. A knowledge of structural botany will be found useful in order to follow the earlier chapters.

I was particularly interested in Part 3, which deals with vegetative propagation. Under the rather unfamiliar heading of "cuttage" is described the various methods by which plants are raised from cuttings. It includes an up-to-date account of the still rather new technique of mist propagation. The authors point out the snags as well as the advantages of this method of increasing plants.

A wide range of both hardy and tender plants is dealt with, and much information has been collected about seeds and the treatment of these, both prior to and at the time of sowing. A special section deals with propagation structures.

The illustrations, particularly the line drawings, are of great value to students of horticulture and portray various intricacies of grafting and budding so clearly that even a novice, after studying these, should have little difficulty in acquiring proficiency in these practices.

A place for this book should be found on the bookshelf of every plantsman who takes plant propagation seriously, and although mainly concerned with producing plants in commercial quantities, the methods described can be adapted for more modest needs.

F. P. KNIGHT

"Amateur Gardening Pocket Guide." Edited by A. G. L. Hellyer. 312 pp. (W. H. & L. Collingridge Ltd.) 10*s*. 6*d*.

This is an enlarged and revised edition of the well known pocket guide first published in 1941. The information has been revised and brought up to date and the larger type makes it much easier to read. The plan is unchanged, that is the guide is still divided into sections—e.g. Vegetable Garden, Fruit Garden, Soil Cultivation, etc. The excellent index makes reference quick and easy.

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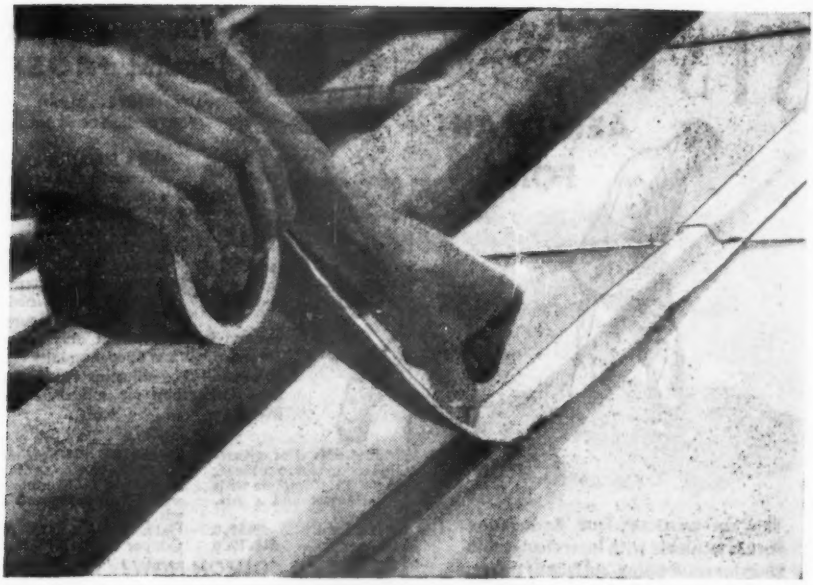

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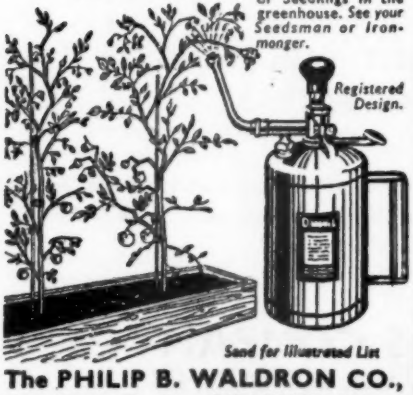

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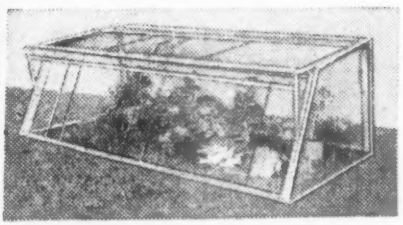

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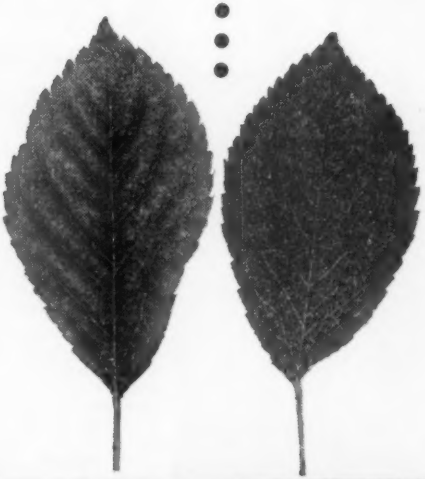
MANGANESE deficiency in the cherry



Deficiency of manganese is commonly observed in cherries—sweet and sour. The picture shows on the right a normal leaf of sour cherry and on the left a leaf from a tree deficient in manganese. Note the marked pattern of the loss of green colour (chlorosis) which begins near the leaf margins and progresses between the veins towards the midrib.

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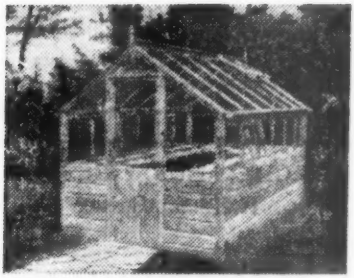

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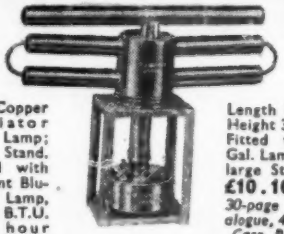

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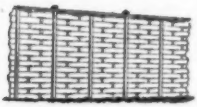

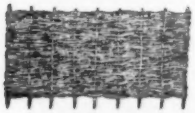

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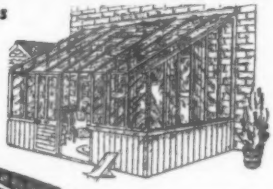

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